COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper — Second-class postage paid at Boston, Mass., and additional mailing offices

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Price: $12/year — October 23, 1974 — Vol. VIII, No. 43

NEWSPAPER

Cara-van 1975

Forum to Emphasize Implementation

NEWTON, Mass. – Responding to user requests for more "nuts and bolts," the program for *Computerworld's* 1975 Computer Caravan will have as its theme "Emphasis: Implementation."

Among the innovations planned for this year's traveling conference and exposition are a full day's program devoted to software, more panel sessions devoted to local problems in the nine cities visited by the show, plus four new sites.

The new cities include Philadelphia, Hartford, St. Paul and Seattle. Although these cities are not as big as some of the previous Caravan sites, organizers anticipate total attendance will again top 30,000.

Neal Wilder, CW vice-president of marketing, noted the predicted spot fuel shortages and/or surcharges could bolster rather than cut Caravan attendance because of consequent limitations on long-distance travel for management education or "shopping trips."

The format for the Computer Users' Forum will be repeated, according to Edward Bride, vice-president for editorial services, who noted that local users will again lead workshops slanted toward management problem-solving and equipment selection and usage.

The theme of implementation describes the approach speakers and workshop leaders will use during the forum, Bride noted.

With national computer conferences giving continued emphasis to theory, despite their increasing attention to users, past Caravan attendees have asked for "more nuts and bolts," Bride said.

Thus, the panel sessions and workshops will stress the application of a particular device or software package in solving problems, rather than discussing how that device might be indicative of computer industry trends, he added.

Workshop Schedules

A change in the time schedule has placed all four workshops before lunch each day. Workshops will still be re-

(Continued on Page 8)

On the Inside This Week

Working in Computer Room May Be an Ocular Benefit — *Page 9*

HP Packs 192K Memory Into 17-1/2 In. Mini — *Page 27*

Communications 21
Computer Industry 33
Editorial 10
Financial 46
Software/Services 15
Systems/Peripherals 27

Operates Under RSX-11D

PDP-11 Cobol Uses '74 Standard, Paging

By Don Leavitt
Of the CW Staff

MAYNARD, Mass. – An ANS Cobol compiler geared to the 1974 standard specifications and an object time system that uses paging to handle programs larger than available main memory are the key ingredients of PDP-11 Cobol announced last week by Digital Equipment Corp. (DEC).

The processor has been implemented under DEC's RSX-11D operating system and requires a 48K PDP-11/40 or 11/45. It will be adapted to the more advanced RSTS environment "in the future," a DEC spokesman said, but he had no comment on when that implementation might be ready.

Though obviously pleased with having Cobol, company sources at the announcement were, in fact, very careful with their claims for the new product. "Entry level," "not full-blown" and "not really meant for the Cobol shop that wants to replace a full-scale mainframe" were the phrases used.

This Cobol package is intended to provide the shop already heavily focused on real-time operations and time-sharing with still another facility, the company said. And it appears to be fairly fast; in a demonstration, a 136-statement program compiled in 17 seconds.

More Than Standard

The compiler runs in 20K words and it has many features of the new Cobol standard, plus several extensions as well. It has full level 2 sequential I/O, full level 2 relative I/O and partial level 2 library and nucleus support, DEC claimed.

Full level 1 support for the Segmentation module is provided by a paging mechanism called "software virtual storage system," which makes main storage space management chores transparent to the user. The Procedure Division becomes a series of command blocks which are held in virtual storage until needed, DEC explained.

The system requires enough main memory for at least three 256-word pages, controlled by a "simple first in, first out" algorithm, a spokesman said. The demonstration program which would have filled 14-1/2K words without paging, actually ran in 3K with the "virtual" support.

Cobol extensions include an OPEN EXTEND facility, by which users may add records to existing sequential files – with copying of the file. A dynamic mode of operation, under which files may be processed both sequentially and randomly by the same program, is also part of the DEC package.

A REWRITE verb to update existing records in addition to a WRITE verb for new records is also included, as is backing for the character manipulation verbs INSPECT, STRING and UNSTRING, DEC said.

Although the compiler itself is reentrant – as are most programs under RSX-11D – the object time support sys-

(Continued on Page 2)

Itel Add-On VS Alternative At Half Price of IBM Memory

By a CW Staff Writer

SAN FRANCISCO – While IBM promotes virtual storage as an alternative to larger real memory, Itel Corp. has come up with a double-barreled real memory option for the 370/145 user.

The Itel Hierarchical Main Memory (HMM) offers semiconductor memory at half the IBM price and can take the 145 user up to 4M bytes.

Itel sees the HMM as an alternative to the use of disk drives for virtual storage. HMM users can utilize virtual hardware and the virtual operating system, yet add enough main memory to eliminate the overhead associated with paging, the company said.

The use of HMM is transparent to the programmer, Itel added.

One disadvantage to the Itel offering is that the add-on memory uses a buffer or cache memory to control a second-level memory which is slower than native memory. This hierarchical approach is said to be similar to the approach IBM uses in the 370/158 and 168.

Itel admitted the user sacrifices 10% of his throughput on a byte-by-byte basis with data stored in the HMM, but said the overall price performance is between 1.5 and 2 times that of comparable IBM memory.

The Itel cache memory consists of 16K of bipolar memory; the main memory is MOS.

Access time for the HMM is rated at 585 nsec compared with 540 nsec for standard IBM memory.

HMM is available in 512K-byte blocks but needs a minimum of 256K of IBM memory. A 512K system is priced at $142,400; a 1M-byte system is $276,350.

Itel is at One Embarcadero Center, 94111.

Privacy Issue Stirring On, Off the Hill

Bill Action Delayed; Much Debate Expected

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – With congressmen preoccupied with November elections and "no real enthusiasm left for taking up controversial legislation before recess," privacy bills scheduled to be called up last week are on the back burner again until next month, Capitol observers said.

Both bills hammered out by the respective House and Senate Government Operations Committees are expected to stir considerable debate, with as many as 10 amendments anticipated on the Moorhead Bill (H.R. 16373), the final version of the privacy bill in the House.

In the Senate, staff members are "negotiating" with senators who have as many as 15 amendments to offer on the Ervin Bill, S. 3418.

Capitol Hill spokesmen predict the leadership in each house will call up the bills for debate before Christmas and that the language of the House bill will prevail in conference "because it is more specific – a better bill."

Although some of the earlier bills extended jurisdiction to data banks maintained in the private sector, control of the private sector has been abandoned for the short term and both bills now confine themselves to Federal Government data collection – both manual and automated – with one exception; the Senate bill extends its privacy standards to government contractors as well.

Other areas of agreement now include provisions which require agencies to make public the existence of all personal data files, to spell out the right of individuals to access and correct their files and to restrict disclosure of file contents.

There are key differences, however, between the two bills: a federal privacy commission proposed by the Senate was omitted by the House and access to criminal records, ignored in the House bill, is covered in a limited fashion by the Senate.

Provisions limiting the use of the Social Security Number also have been dropped by both houses, but congressmen who

(Continued on Page 2)

3 Federal Officials Report on Progress

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – Three federal officials representing Congress and the executive branch brought members of the Computer Law Association, Inc. up-to-date on the state of privacy at the national level of government during a recent meeting here.

Dropping in long enough to deliver his speech before hurrying back to the House of Representatives where a privacy bill was scheduled to go to the floor, Rep. Edward I. Koch (D-N.Y.) expressed his dissatisfaction with certain elements of the Moorhead proposal on privacy.

"H.R. 16373 is less expansive in protecting the rights of individuals than is the Senate bill," Koch said. "While the House bill exempts law enforcement files from its stipulations, S. 3418 excludes such files from privacy considerations only when the head of an agency defines

(Continued on Page 6)

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Second-class postage paid at Boston, Mass., and additional mailing offices. Published weekly (except: a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington St., Newton, Mass. 02160.
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50 cents a copy; $12 a year in the U.S.; $20 a year for Canada and PUAS; all other foreign, $36 a year. Four weeks notice required for change of address.
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Computerworld can be purchased on 35mm microfilm in half-volumes (six-month periods) through University Microfilm, Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700.

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Much Debate Expected on Privacy Bills

(Continued from Page 1)

feel strongly about the issue are expected to restore Social Security Number limitations when the bills are taken up in each house.

Protection Commission

The Senate bill provides for a five-member, nonregulatory privacy protection commission, established for three years.

The commission is basically "a study group" and has "no force of law" over agencies, a Senate Government Operations Committee staff member explained.

The House makes no provision for such a board or committee in its bill.

With regard to criminal justice files, the Senate bill exempts from the legislation law enforcement intelligence and investigative information.

Arrest records, however, held with manually filed fingerprints by the Federal Bureau of Investigation, are covered by the Senate bill.

(A House spokesman explained that since the House Judiciary Committee is working on a bill dealing exclusively with access to criminal justice records for introduction in January, that issue was not addressed in this more general legislation.)

With regard to the Social Security Number, the amendment expected in both houses will make its use as an identifier unlawful in data files established after 1975.

The amendment expected in the Senate also includes some provisions that would protect from discrimination the person who refuses to provide his number to a bank or insurance company, for example, as well as to a federal agency.

Another amendment expected to spur considerable debate in the House is a proposal by Rep. John Erlenborn (R-Ill.) that would allow agencies to keep confidential from the subject any information obtained in the course of investigating eligibility for federal employment, security clearance, military service and federal contracts.

Civil service examinations would also be included in this category of exempt files.

The House bill restricts disclosure of personal information to any other person or agency with the following exceptions: officers or employees within that agency with a "need-to-know"; routine use as published by the agency in the Federal Register; Bureau of the Census for statutory purposes; statistical use (only if in unidentifiable form); historical data to the National Archives; law enforcement agencies; emergencies where the health or safety of an individual is in danger; and congressional committees.

A record of disclosures outside the agency must be maintained and this record, too, is open to scrutiny unless the agency is a law enforcement agency.

The House bill describes a citizen's right of access as follows:

- Individuals can see any records an agency has on him.
- Individuals can ask for their records to be changed, and the agency must comply or allow an appeal.
- In the case of dispute arising out of the appeal, the individual has the right to file a statement that becomes part of the record and, on disclosure, the statement also must be disclosed.
- When a record is corrected, the agency must inform any other agency who has received that record in the past two years.

Upon enactment of the privacy law, the House bill provides that each agency publish in the Federal Register a notice of the existence and character of each system of records including its name, location, category of individuals included, routine purposes and an address where the individual can inquire about that record.

The Senate bill covers these general provisions in a similar manner.

The House bill also provides no agency may maintain any records concerning the religious beliefs, political beliefs or activities of an individual unless it has express authority by statute or permission from the individual about whom the record is being maintained.

The Senate bill, by comparison, states that no records may be maintained describing "how an individual exercises rights guaranteed by the first amendment unless the head of the agency determines that this is required for the administration of a statute."

Mass. Issues Order on Fair Practices

BOSTON – Interest in the right of privacy on the state level has culminated in a Fair Information Practices Executive Order issued by Massachusetts Gov. Francis W. Sargent, effective Jan. 8, 1975.

Directed to all state agencies – other than criminal justice agencies – that collect and use personal information about the citizens of Massachusetts, Sargent's order says each person requested by an agency to supply personal data not for statistical purposes has the following rights:

- Knowledge of the information's intended use.
- Knowledge as to whether he is legally required to supply such data and any legal consequences which may arise from his refusal.

In addition, he shall be permitted, upon request to any agency, an opportunity to view information held by that agency unless doing so would be contrary to statute.

He may challenge the accuracy, completeness or mode of maintenance or dissemination of any personal data about him maintained by that agency, and if any correction or addition to the contents is not made within 30 days, he may add a statement that must be maintained and disseminated with the original record.

Data collection by state agencies must conform to the following principles:

- No agency shall collect personal data other than that necessary to perform its lawfully authorized functions.
- Each agency shall designate one officer responsible for such data systems.
- No agency shall use personal data collected for one purpose for another unrelated purpose without the consent or knowledge of the data subject.
- Each agency shall assure that agencies who receive such information are aware of the statutes and this executive order that must be observed in handling personal information.
- An agency may computerize personal data only after identifying all reasonably foreseeable threats to the security of such data by computerization and take steps to minimize such threats.
- Within 90 days after the effective date of this order, the Secretary of Administration shall adopt regulations to implement the provisions and purposes of this order, providing for methods of administrative appeal by injured citizens.

The Executive Order is an official expression of the state's policy regarding privacy rights of its citizens, for guidance of state officers who must carry out the law.

In the case where a statute exists, it is subordinate to and cannot affect the scope of that statute. It has the force of law until legislation is enacted.

DEC PDP-11 Cobol Uses 1974 Standard, Paging

(Continued from Page 1)

tem is not.

Multiple programs can be run concurrently, but each requires its own copy of the object time system (12K words) and coding specific to the user's program, including Data Division, I/O buffers, Procedure Division literals (in about 2-1/2K words) and the mandatory three-page area for the program logic.

DEC's current Cobol does not include support for the new standard's Communications module nor does it support the CALL/CANCEL facility. The system does not have an imbedded SORT verb or backing for indexed sequential I/O like IBM's Isam.

Limitations in the underlying RSX-11D operating system prevents users of the new Cobol system from working with multiple volume magnetic tape files, DEC admitted.

The new language system is an outgrowth of the interpretive compiler DEC purchased some time ago from Computer Power Australia [CW, March 27]. When DEC acquired the system, however, it was geared to the 1968 Cobol standard and to DEC's earlier DOS environment. The rework needed to get the system up to the 1974 specifications and the more advanced operating system was done here in the U.S. "almost completely," DEC said.

The system has been out since June in seven user sites with a range of application interests. Though bugs have been found, they have been corrected and the users are generally "well satisfied" with both the programming and the documentation, DEC said.

The PDP-11 Cobol system will be available for general distribution at the end of this month in two versions, with or without supportive services and a warranty from DEC. In addition to the Cobol compiler and object time support, the package – in both versions – includes a stand-alone sort, a report writer and a reformatting utility.

The bare-bones version, without support or warranty, costs $4,300. The fully supported package has a $7,000 price tag. Support after the first year can be continued for $1,000 annually. Enhancements to the system will be separately priced, DEC noted.

Ansi Standard Available

NEW YORK – The new Cobol standard has finally been published and is now available from the American National Standards Institute (Ansi). And so the phrase "ANS Cobol" should now be used only for those compilers that meet the 1974 specifications.

Technically, systems that meet only the 1968 standard are no longer "ANS Cobol," an Ansi source noted.

Ansi completed its formal approval of the 1974 standard last May but final editing and production problems prevented its release until now, a member of the X3J4 committee responsible for the standard explained.

"Several hundred pages long," the soft-covered 8-1/2 in. by 11 in. three-hole punched manual costs $12 and can be ordered under its formal designation, *Programming Languages: Cobol, X3.23-1974,* from Ansi, 1430 Broadway, 10018.

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Davis Warns of New Dimensions

DP/Legal Communities 'Inadequate' to Privacy Task

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – "The privacy problem has spotlighted our inadequacies in dealing with technologies that directly interact with individuals and their rights or desires," Ruth M. Davis, director of the Institute for Computer Sciences and Technology within the National Bureau of Standards (NBS) told a meeting of the Computer Law Association, Inc. here recently.

In an effort to place the problem in perspective, Davis commented privacy has become urgent because "it is not an isolated issue, but a harbinger of 'things to come.'"

As our service economy becomes more dependent on automated information systems and as individuals place increasing emphasis on their individual rights, privacy will serve to illustrate the clash of interests between individual rights and technological necessity, she said.

She charged neither the legal nor the technological communities have indicated they are particularly able to predict or handle these conflicts of interest.

"More importantly," she added, "the privacy problem has now assumed such proportions that it can no longer be resolved by these two communities, either acting separately or collectively."

New Dimensions

The problem has acquired economic, regulatory, political, domestic and international dimensions in addition to its earlier technological and legal elements, Davis noted. And "the ability to separate the privacy problem into resolvable components keeps decreasing as the dimensions of the problem keep increasing."

In defining the scope of her talk, Davis focused on one area of the privacy problem: management via automated information systems with emphasis on computers and related equipment and data terminals. She also concentrated on those information management practices controlling the collection, processing, correction, purging, dissemination and reviewing of data.

Assessing the problem within this framework, Davis identified several "major technology problem areas" which act as barriers to the resolution of the privacy issue.

Many of the technologies devised to protect information contained in automated systems haven't been resolved technically but need solution if the intent of the current congressional bills on privacy is to be met, she noted.

Davis also remarked these technologies haven't been defined sufficiently for R&D cost estimates to be credible or for marketplace costs of their implementation to be predictable.

More particularly, she stressed the importance of resolving such technological issues as the use of "universal" individual identifying numbers; the means of unique individual identification for access of information by remote terminals; the means of controlling access to automated information systems; accurate methods of purging, sealing, deleting and correcting files containing personal information; procedures for maintaining records of access to files; and measures of the adequacy of security effectiveness.

'Traditional Discourtesy'

"The traditional discourtesy shown by each of the communities of specialists who must work together if these technical, legal and economic problems are to be solved simply aggravates this situation," Davis said.

"We need a sympathetic tolerance of each other's jargon and a willingness to recognize the importance of each specialty in dealing with the overall problem of privacy," she cautioned.

She noted a half dozen recent instances of cooperation between the technical and legal professions, including:

CW Photos by E. Holmes
Davis

- The National Academy of Sciences, Russell Sage Foundation-sponsored project which drew together legal and technical expertise and culminated in the 1972 publication of *Databanks in a Free Society*.
- The Roscoe Pound-American Trial Lawyers Foundation's Annual Chief Justice Earl Warren Conference of 1974 which brought technologists and lawyers together to discuss "Privacy in a Free Society."
- Judge John J. Sirica's use of a panel of acoustic and electronic recording experts in analyzing the Watergate tapes.
- The formation of a joint committee by the American Bar Association and the American Association of the Advancement of Science.
- The use the Federal Trade Commission makes of its technologists, economists and lawyers in handling its regulatory functions under the Fair Credit Reporting Act of 1971.
- The 1973 and 1974 NBS-sponsored "Privacy and Security" conferences which brought together state and national congressmen, economists, civil libertarians, industry representatives and technologists to discuss the need for government action in the privacy area.

While Davis considers these attempts at collaboration encouraging, she contended such cooperation alone will not solve the privacy problem.

"Privacy is nice if you don't have to pay for it," she said. Individual citizens, professions and governments must decide whether they really want privacy.

"Technologists have a responsibility to provide privacy options in a variety of amounts and costs," she concluded.

DP Abuse May Prove Attractive to Underworld

WASHINGTON, D.C. – As privacy issues force data to become more sequestered and secure, the increasing value of such information could make computer abuse more attractive to organized crime, a lawyer with a background in computers told attendees of a Computer Law Association, Inc. meeting here recently.

Nycum

A member of MacLeod, Fuller, Muir & Godwin in Palo Alto, Calif., and principal legal consultant to the Stanford Research Institute's National Science Foundation-sponsored computer abuse project, Susan Nycum noted the participation of the underworld would alter the portrait of the average perpetrator of computer crimes.

"Normally, these people are men between 18 and the mid-30s in age and are very bright and highly motivated," she said.

"Often programmers, computer criminals see the crime as a challenge to their intelligence and ability." While she described them as having a "Robin Hood complex," Nycum added "they seldom give what they steal to the poor."

In general, the computer abuser has never been in trouble before, and half of them use an accomplice. "This represents a departure from most white collar crime, only 4% of which is perpetrated with accomplices," she remarked.

Other Types of Crime

While privacy will affect the value of information contained in automated systems and could alter the importance of these crimes from a criminal point of view, Nycum said crimes involving privacy only constitute one category of computer abuse.

"Privacy issues are only involved in acts against the assets contained in the computer," she commented. "Crimes can also be committed against the system or the hardware itself, against others by using the computer as the crime tool and against computers as a symbol of something hated."

Crimes against computer assets and, potentially, against privacy involve alterations or theft of the system's input, program or output.

Nycum noted the justified refusal of two psychiatrists in California to include the names of their patients in a state data bank on mental illness, the actions of a programmer accused of bigotry in writing a program which excluded blacks from consideration for hiring by his company and the unauthorized use of mail lists designed for election purposes in sending out junk mail as examples of privacy violations in each of these areas.

In a forecast of future computer crimes, she suggested violation of privacy could become the focus and not the by-product of some computer abuse, particularly if perpetrated by organized crime.

Hypothesizing that, in the long run, the incidence of financial and information crime will go down because of the automation of transactions, the increased security of the processing and storage of information and the existence of fewer potential perpetrators, Nycum predicted the losses per incident will go up because of the higher costs and dangers to perpetrators and the exposure of greater informational assets.

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Progress Report:

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HIGHEST MEMORY ADDRESSING

Even IBM must change address lines when you add its memory. But not Cambridge. 370/STOR 145 is directly addressable up to 2048K without any change. It floats on top of any IBM address level. That's the secret of our modular expansion, lack of CPU alteration, and freedom from console file tampering.

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Poor Legislation Seen Danger to Citizens, Industry

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – The greatest danger for private industry and citizens in the enactment of privacy laws is legislation through ignorance, an attorney warned an audience of lawyers and computer specialists at a recent conference here.

"No congressman, except someone interested in immediate retirement, would vote against privacy," commented Francis M. Gregory Jr., a lawyer with the Washington, D.C.-based firm of Sutherland, Asbill & Brennan.

CW at CLA

"Because any bill reported in Congress is likely to be passed, laws will be enacted which lack the benefit of the experiences of private industry in the area of privacy," he added.

Addressing the same meeting of Computer Law Association, Inc., Alan F. Westin, professor of public law and government at Columbia University, indicated privacy legislation for the private sector would be best initiated at the local level.

Maintaining that private industry will be federally regulated in the area of privacy sooner rather than later, Gregory said private enterprise must move early in the stages of legislation to make its views known to Congress.

Anticipating the Koch-Goldwater bill on privacy in the private sector will be a major issue before the House of Representatives next year, Gregory remarked he hopes the committees involved will "take the time for businesses to come in and explain their approaches to privacy issues."

He noted neither the Moorhead nor the Ervin committees on the House and Senate privacy bills held one day's hearings on the activities of private industry in the area of privacy.

Given inflation, the costs of implementing automated information systems and the costs of compliance with potential privacy legislation, Gregory suggested that the Sherman Antitrust and the Fair Credit Reporting Acts might adequately regulate privacy in the private sector without additional legislation.

Local Efforts

Working from the assumption that legislation aimed at insuring privacy does need to be passed, Westin stressed the need to bring computer experts together on the local and state levels to discuss privacy issues.

He cited efforts in Wichita Falls, Texas, Charlotte, N.C. and Berkeley, Calif. to resolve these problems locally.

In Berkeley, Westin noted the city council requires businesses employing automated information systems to file privacy impact statements to be reviewed by a variety of people in a wide range of professions. Once screened for potential violations of civil liberties, the statement goes back to the council which holds public hearings on its content.

He argued that, once developed locally, techniques for managing information systems in the area of privacy could be exported and adapted to other areas.

"We also have a tendency to play down privacy activity on the state level," Westin said. "Slightly over 100 privacy bills were considered by state legislatures last year and 35 of these were actually adopted by various states as of Sept. 1974."

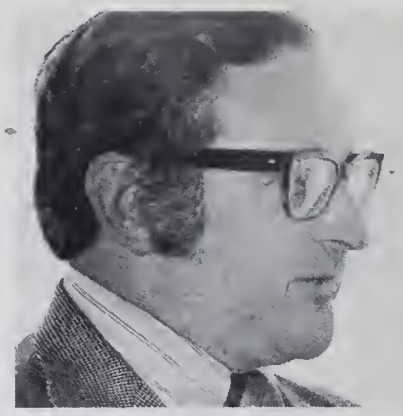
One state has attempted to define fair information practices; four have written the right to privacy into their constitutions; one has limited the use of the Social Security Number; eight have established study commissions on privacy; three have permanent recordkeeping commisssions; three have enacted laws regarding health records; two are regulating school records; six have laws regarding the confidentiality of arrest records; three have set up criminal justice systems; and four have created laws on credit reporting, according to Westin.

State legislatures tend to pass laws on two levels, he observed; either their bills reflect a "global approach" to privacy by dealing with statements of rights and constitutions, or they treat privacy on an area-by-area basis, concentrating first on health, then on education, and so forth.

On the federal level, "we've been ready to legislate very prematurely," Westin commented. "Hearings have generally been inadequate, although the Ervin hearings did succeed in pointing up the weakness of trying to draft a bill that would legislate for the world by including the private in addition to the public sector under one law."

Whatever privacy bills are enacted, Westin stressed the need for some kind of privacy board "to act as a place where individuals can take complaints short of having to go to court."

While fulfilling "what the Swedes call 'the wailing wall function,' such a board could also provide the kind of pressure for responsible action the public needs."



Westin

CW Photos by E. Holmes
Gregory

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Federal Officials Report Progress in Privacy Area

(Continued from Page 1)

the information concerned as essential to law enforcement or national defense."

In addition, the House bill fails to establish a federal privacy board to insure uniformity of procedure and administration of privacy regulations, Koch continued.

He said he and other members of the House plan to offer amendments to these "deficiencies" when the bill comes to the floor.

Despite the omissions he believes it contains, Koch contended the passage of this or the Senate's privacy bill will benefit the consumer. "Agencies will now consider what they're collecting and, because they know individuals have the right to correct their files, agencies should be better at policing themselves in the area of privacy," he said.

Koch added that for the first time the burden of proof is on the agency to show why a file should not be exhibited.

"There is a balance to be struck in terms of what the government needs to function and what individuals deserve in order to keep elements of their lives private," he commented. "The bills advanced in the House and the Senate attempt to achieve this balance, though they haven't reached it yet."

Executive Viewpoint

From the point of view of the executive branch, Douglas Metz, deputy executive director of the Domestic Council Committee on the Right of Privacy, reported the progress made on the 14 recommendations submitted to the President by the council last July.

"Should Congress fail to enact privacy legislation before the end of this session, the President will issue an executive order designed to regulate the federal agencies in this area," Metz said.

The council has also asked the National Bureau of Standards to accelerate its research into privacy standards and to submit its report by April 1975 rather than "sometime in '76," he noted.

Metz

Koch

Urging the Federal Government to exercise leadership in protecting individuals in the marketplace, the council has sponsored the writing of a code of fair practices and hopes to obtain voluntary commitments from corporations in the retail, credit card and insurance industries, he explained.

This code should be released for review sometime after the November elections, Metz added.

The council on privacy has also agreed individuals should be allowed to object to the inclusion of their names on mail lists sold by the government.

Metz remarked the council has supported comprehensive legislation which would make all income tax returns confidential with any exceptions to be determined by Congress and not by the President.

In addition, studies of the privacy issues involved in electronic funds transfer systems (EFTS) and in maintaining health records have been solicited from the Department of Health, Education and Welfare (HEW), he said.

Recommendations to Congress

The council also has made a number of recommendations to Congress which directly affect the bills currently under way in both the House and the Senate. Among these are suggestions that federal agencies define the purpose and requirements of supplying data for the consumer, that privacy bills codify current Department of Defense regulations prohibiting surveillance of civilians, that access of law enforcement agencies to bank records be restricted and that amendments to the Fair Credit Reporting Act allow individuals copies, in addition to visual access, of records held on them.

Metz claimed the council has also initiated investigations into privacy legislation dealing with criminal justice, the maintenance of employee records by the private sector and federal employees' rights.

Finally, "in an effort to work closely with state and local interest groups to exchange views on privacy," the council will sponsor a conference in December with representative groups from state and local governments, Metz said.

He noted the President plans to ask Nelson Rockefeller to assume chairmanship of the committee if his appointment to the vice-presidency is confirmed by the Senate, and that the committee will probably continue to operate on an ad hoc basis through 1977.

'Invite Doubt'

While the council "has initiated much valuable thinking on privacy matters, we should invite doubt and questions of the recommendations put forth by this advisory committee," David B.H. Martin, special assistant to the secretary and director of the fair information practices staff of HEW, told the audience.

While he considered congressional hearings on privacy "deplorable," Martin conceded "perhaps broadly brushed, badly conceived, poorly drafted bills are necessary to bring the privacy issue to public attention."

Reporting on the activities of HEW, he commented the department is "participating actively to insure restrictions comparable to those of the census bureau on confidentiality for all agencies gathering statistical information."

He expects HEW will also announce its recommendations on the use of the Social Security Number shortly.

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Caravan '75 Program Set to Roll With Emphasis on Implementation

(Continued from Page 1)

peated, however, so more than one can be attended.

Another new feature, a wrap-up panel, will be held each day after lunch and will serve to put all the day's problems and solutions into perspective. This is designed to promote a group examination of the day's theme and to permit the attendees to ask "that last question."

The opening day workshops will focus on computer systems management, specifically on configuring the data center, performance measurement, dedicated systems and small centers.

On the middle day in each city, software will be the topic of discussion. Workshop subjects include data base management systems, evaluating applications, programming the small business system and utility software.

The third day's sessions will concentrate on data communications. Data transmission options, network management, terminals and front-end processors will be the main areas of emphasis here.

Following the wrap-up panels will be special open sessions. In many cases these sessions, open to all Caravan attendees, will be cosponsored by local chapters of national professional societies. The sessions will look at professional development, virtual versus real storage and "The Human Interface: External Opportunities and Dangers for Data Communications Users."

The "recruitment" effort for the local and regional users who conduct the workshops is well under way, according to Toni Wiseman, forum coordinator.

For the eastern portion of the nine-city tour, Wiseman said management-level computer users from Southern Railway, the American Revolution Bicentennial Administration and Pratt & Whitney Aircraft were "typical" of the type of users who had volunteered.

The participants' roster for Atlanta, where the Caravan begins Feb. 24, is almost complete, she added.

Exhibits Up

This year's exhibit, with 95 booths, is already 50% larger than last year's, according to Wilder.

Software exhibits are the biggest area of improvement, he noted, with six independent software companies already signed on for the tour. Each of these firms, in addition to having a booth on the exhibit floor, will be conducting an independent seminar on its product.

Other exhibitors will be running seminars as well.

"Virtually every element of a system will be on display, so that the attendee will have an opportunity to look into every aspect of the system he needs from host computer to the smallest terminal, even down to autotransactional devices," Wilder said.

A sample of the exhibitors includes ICC Milgo and AT&T in the communications area; Cullinane Corp., Software International, Inc. and Pansophic Systems, Inc. for software; and Potter Instrument Co., Control Data Corp., California Computer Products, Inc. and Cambridge Memories, Inc. in the peripherals sector.

Large terminal companies such as Incoterm Corp., Sycor, Inc., Hazeltine Corp. and Datapoint Corp. will be on hand, as will Computer Devices, Inc. and Computer Transceiver Systems for those looking at smaller terminals.

In addition to the regular touring exhibitors, 10 companies will be exhibiting on a regional basis.

The 1975 Caravan will open in Atlanta, Feb. 24-26. From there it will journey on to Philadelphia, Hartford, New York, Cleveland, Chicago, St. Paul, Seattle and San Francisco.

Put Money in EFTS, Local Banks Urged

NEW ORLEANS – The future success of the banking industry requires the involvement of all banks in the development of electronic funds transfer systems (EFTS), the president of the American Bankers Association (ABA) said here recently.

"Though checks will still be used, it seems to me every bank – large and small – will have to have access to electronic transfer services and systems in order to succeed," Rex J. Morthland told the annual convention of the ABA Bank Card Division.

"Of course, much of the responsibility for assuring that community banks have access to EFTS lies with community banks themselves. And the whole industry has a stake in seeing that electronic transfers do not become the exclusive domain of larger banks," he said. "The survival of banking depends on it."

Morthland told the nearly 800 bank card managers from across the country that "bank cards are the cutting edge for electronic transfer systems – the backbone of evolving technologies and payment methods."

He told them that they had a responsibility to draw the smaller banks into the evolving payments systems.

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Atmosphere of Computer Room May Be Beneficial to the Eyes

NEW YORK – Personnel working in climate-controlled computer rooms may have healthier eyes than their counterparts who work in other locations because the cooler temperatures and higher humidity required in computer rooms have a beneficial effect on the eyes, according to the Society for Visual Care (SVC).

"The special atmospheric conditions which help a computer function optimally may also help the eye," explained Dr. Richard Hopping, an SVC consultant.

"For instance, high humidity and cooler temperatures alleviate some discomfort for those individuals who have a lowered tearing and blinking rate. Warm, dry air tends to make the eyes' naturally moist lubricating surface evaporate; the computer room climate allows for much greater moisture retention."

The eye care specialist noted that DPers who wear contact lenses have particular problems in dry atmospheric conditions but complain less when they work in the climate-controlled room.

When the contact-wearers once complained their vision was sometimes hazy and they felt like their contacts were dirty, the problems lessened in the computer room situation.

The doctor attributes the difference to the temperature and moisture level in the air which retards the evaporation of eye lubricants.

Hopping noted the lack of cigarette smoke in the computer area is also a plus to visual health. "Cigarette, cigar and pipe smoke present very real irritations to the eye," he said. "They not only foul the air but also introduce small particles into the atmosphere, which can cause discomfort when contacting the eye. Further, smoke itself has a drying effect on the eye."

Visual Disadvantages

SVC emphasized, however, that the computer room also has its share of visual disadvantages.

Generally, computer room lighting causes glare. Most computer facilities are illuminated with overhead fluorescent lights and although these lamps produce the least heat, they may create uneven lighting and shadows on the working surfaces.

Computer printouts also have an adverse effect. The lighter the printout, the more concentration is required for reading. Coupled with inadequate lighting, the two conditions can cause eye strain.

Rows of numbers and letters tend to blur and the eyes may become red and irritated.

Hopping suggested occasionally closing the eyes for a few seconds when doing close work to alleviate the problem. When the eye lids are shut, tears bathe and refresh the eyes.

He also said it is a good idea to look out into the distance occasionally when doing close work. Extreme concentration at close working levels places tension on the muscles which control eye accommodation, and looking into a distance provides relaxation.

'Preventive Maintenance'

Hopping noted that the intense visual demands the computer field entails makes regular visits to an eye-care professional a good safeguard.

"In the data processing area," he said, "the demands on clear and accurate vision are enormous. Even momentary blurring of sight, brought about by eye strain, can cause significant problems.

"The best precaution is a thorough eye examination."

Texas Group Opposes Interagency Data Bank

AUSTIN, Texas – A proposed interagency computer data bank is being challenged by the Texas Civil Liberties Union because TCLU officials charge it would make possible a cradle-to-the-grave police state surveillance program.

Information would be coordinated about individuals on a state and federal level, encompassing a wide range of mental health and youth offender agencies, according to TCLU executive director John Duncan. In a protest to the Governor's Office of Information Services, he said "the plan creates the potential that with the press of a button, a nosy dean can find out if a student has received psychiatric services from the Department of Mental Health or a prying bureaucrat in the Employment Commission can find out if a person was a juvenile offender years ago.

"The potential for invasion of privacy is almost unlimited," he said.

Monitors Help 'Debug' Potato Crop

UNIVERISTY PARK, Pa. – Although the most historic outbreak of "phytophora infestans" occurred in Ireland over a century ago, potato growers in Pennsylvania alone spend $2 million annually to protect their fields from the disease.

The spraying of chemical fungicides to control the blight, which a farmer might do several times a month, is both expensive and ecologically undesirable – but the alternative is a ruined crop.

To help farmers decide whether they need to spray, Pennsylvania State Univeristy has set up an experimental program called Blitecast which serves 110 farmers in Pennsylvania and elsewhere.

To use Blitecast, a farmer puts monitoring equipment in his fields that continuously charts temperature and relative humidity. The fungus thrives when days are warm, nights are cool and relative humidity is high – 90% or more.

Once a week, the farmer calls up the university's plant pathology department and reads his data to a staff member. The staffer enters the data into a terminal and relays a quick spray/no spray decision to the farmer.

Dr. Raymond A. Krause, who set up the program on a university IBM 370/168, said the program works accurately if the farmer follows the program's instructions promptly.

Krause added that farmers in several other states call up to use the program and a terminal at the University of Maine extension service relays the service to potato growers there.

One Pennsylvania potato grower who uses the program noted that he formerly sprayed every five to seven days from the time his plants were six inches high. The forecasting services has cut that number, he said, and the elimination of one spraying of his 100 acres paid for the $240 monitoring device.

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Editorial

Will We Be Forced to Accept Mandated Privacy Controls?

The Republican Task Force on Privacy believes there to be a definite need for the development of a universal code of ethics and standard of conduct for the technical, managerial and academic personnel involved in the development and use of personal information systems. The Task Force regards this to be essential *for the automated and computerized information systems.* [emphasis added]

The computer community is coming under close Congressional scrutiny, as this quote from a recent report of the Republican Research Committee's Task Group on Privacy indicates [CW, Oct. 2].

And the computer community's record is deplorable; even if a mandated solution to the lack of professional standards in the privacy area is enacted, its effect could precipitate a situation worse than the present.

To date there have been many half-hearted attempts to define the responsibility of the DP professional in regard to personal information held in information systems.

The ACM, DPMA, SCDP and other organizations have proposed and, in some cases, even adopted a group of high-sounding principles to govern professional attitudes and to foster a concern for privacy within the computer community.

But in almost all cases there has been little follow-through and few or weak penalties for violations of the codes of ethics suggested.

Possibly this lack of any enforcement mechanism, more clearly than any other set of circumstances, underlines the premise that DP is not a profession.

Recognized professions such as medicine and law do have enforcement mechanisms – doctors' licenses can be lifted and lawyers can be disbarred for unprofessional behavior.

DP "professionals," on the other hand, endlessly debate the meaning of the term "professional" and pass high-sounding resolutions about their responsibilities, but to this day no one has made the hard decision to enforce such regulations.

Any legislated code of ethics, however, could be worse than the present system.

Legislators are not known for an in-depth understanding of the work, aspirations and responsibility of those working with DP systems.

Any code of ethics that was legislatively determined could, therefore, cripple the people working in DP and tie their hands to specified solutions to such problems as the protection of individual privacy in computerized data banks.

Mandated regulations, while well intentioned, would be hard – if not impossible – to change and adapt to advances in technology and the techniques for managing data centers and information.

The possibility of some type of mandated code of ethics should not be tolerated, but neither can the present system be allowed to continue as is.

The computer community is at a crossroads. If it will not take the responsibility for developing and enforcing well-thought-out and comprehensive professional standards for protecting personal privacy in computerized systems, the government may well impose such standards.

If those who are fond of talking about professionalism do not take action before Congress does, they may well deserve what they get.

"... Take 2 cups sustained-high-profits, add 1/2 tbsp GE-and-RCA-exit-from-market, sprinkle with 1 cup premature-hardware-announcements, fold in 3 tsp renamed-underpriced-equipment ..."

Letters to the Editor

It May Not Be 'Practical,' But It's Been Working Well

Golly, gee! Sure shows what you get for being dumb. Now, if Martin A. Goetz hadn't told us in the Oct. 2 issue it wasn't "practical" to use structured programming techniques without a preprocessor, we would just have gone right on using them without it like we have for the past 10 months.

When our people read Goetz's article, well, you should have heard the weeping and wailing that went on! Here they were thinking that results such as the following were practical, and they didn't use *any* preprocessor:

- All our projects using structured programming techniques finished before or on elapsed time schedule.
- Manhours were tracked and ran well below estimate.
- Lines of code per man-day ran from 36 to 58 in Cobol programs ranging from moderately complex to complex.
- Test runs needed to produce a debugged program were fewer than anticipated.
- Programs produced have shown no "hidden bugs" after going into production.
- Maintenance (not, please note, for errors) work has been easy; projects finished on or before schedule. The maintenance was not done by the people who originally wrote the program.

You know, after reading Goetz's article, one of our more suspicious-natured programmers suggested that just because he worked for Applied Data Research, and just because Applied Data Research sells a preprocessor, Goetz slanted his article in favor of a preprocessor.

Of course, the rest of us condemned our suspicious-minded fellow as a cad and a bounder for thinking such a thing. The very idea! We all *know* that wouldn't happen.

J.W. Lowrey Jr.
Task Force Coordinator
Structured Programming Task Force
McDonnell Douglas Automation Co.
Long Beach, Calif.

Connole Forgot One Ingredient: Competition in World Markets

I enjoyed reading the article "Concern for Worker Must Govern Automation" by Anthony W. Connole [CW, Sept. 25].

I think Connole presents some very strong arguments regarding the social aspects in the use of computers for automating industrial operations. In fact, I was glad to hear that the United Auto Workers, as well as other unions, have endorsed the use of such equipment.

But Connole states "workers given the choice between unemployment with technology and full employment without technology would opt for economic survival." This is understandable from the workers' standpoint, but I cannot understand it from his standpoint as a labor executive.

Apparently, speaking in his capacity for the unions, he disregards the competitiveness of our products in worldwide markets.

Maybe Connole could expand on his ideas for increasing unit output per worker using an automation technology that causes higher unemployment in certain occupations, as opposed to unemployment in many occupations because of inability to compete in the world marketplace due to low productivity per worker.

After all, we must compete in the world marketplace regardless of the current economic condition. Or maybe he is recommending competition only when we have a good economic condition in this country.

Howard F. Brenner
Baltimore, Md.

Ability To Exercise FCRA Options Depends on Knowlege of Provisions

Lest Ken Opp's letter [CW, Sept. 25] provoke a "sez you" response, let me report that I have exercised my Fair Credit Reporting Act (FCRA) rights on three separate occasions with three different credit bureaus in the Philadelphia area.

No refusal of credit was involved on any of the occasions, so I was exercising the lesser-known option.

The reaction varied from puzzlement to gentle antagonism, but in all cases I received the services to which I was entitled under FCRA, without delay and without excessive fees.

Opp's statements are completely confirmed by my experience. The problem now is to inform people of the rights they already have.

What use is a "Bill of Data Rights" if its existence is not widely publicized by us?

Robert Higgins
Newark, Del.

Another Boost for Private Schools

I am writing in reference to recent articles printed against private DP schools.

I am a graduate of a DP school in Syracuse, N.Y. I have had DP in high school; I wanted further education so I signed up. I will match the education I have gained in the 6-1/2 months of my studies against any two-year college student.

Because of this school I waived one year of college courses, and the school I went to offered hands-on training as well as programming and systems work.

Private DP schools do not claim to turn out half-year wonders but they provide the best basic exposure to the field possible.

—
Bruce Donnaly
Cobleskill, N.Y.

Not Virtuous, But Honest

In French, the words for "virtuous and "virtual" are quite different; in English, they are almost identical. The play on words in my title is therefore a property of the tongue shared by the two original software countries. Shared also by them is an intense interest on the part of academics, systems software people in hardware establishments, and software artists in applications environments in redoing the dull old ICL and Honeywell computers their unimaginative managements have procured.

So, away with dour reality: on with the virtual machine! If thine I(BM) offend thee, pluck it out!

This is one of the weaknesses the friendly local salesman plays on when he sells virtual storage, and the more novel Burroughs machines. "Remodel the computer – make it more special, more interesting, perhaps even more efficient," he says.

I speak against that weakness, that interest. Except in a very few university and research environments, I believe software people should work closely with the given structure of their machines. Of course, I exclude individuals and groups exploring systems architecture *per se:* that must go on, and more such explorations are urgently needed. Shortfalls in that area accounted for the failure of "lookahead" in STRETCH and the disappointments of ILLIAC IV.

But for applications people, remodeling the machines is at best an unnecessary expense and often dishonest. One more layer of software, one more insulation blanket to keep the computer power from being used. Virtual machine, emulator, simulator, translator, magic language – call it what you will: I call it a perversion of reality, a dishonesty.

Professionals who are accepting pay to help their organizations do better banking, better nuclear reactor design, better airline operation, better utility billing ought to press for reprogramming major problems in modes that take explicit advantage of the power of the equipment to which their outfits are committed. In assembly language, if possible. Without a fancy operating system, if possible. Off emulation, absolutely, except for very infrequently run "dying" programs.

Above all, no more tinkering with the systems software and the "packages." Ingenuity, which is our valuable and very genuine stock in trade (as distinguished from jargon production and job hopping), should focus on problem analysis and rapid debugging and short run times, not on perverting the equipment.

Be efficient, not clever. Be honest! As the unnamed woman once offered in Carlyle's hearing, accept the universe: I associate myself with his comment, "By God! she'd better."

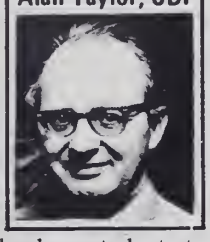
Herb Grosch

Note: I cannot avoid a short reply to Michael Viehman [CW, Oct. 2], who objected to my Staran enthusiasm. The machine features an associative memory, and the only common synonym for "associative" that I know is "content-addressable." Staran is *not* a distributed processor.

Moreover, I was calling for exploration of business file management applications. We have no idea *at all* what the economics would be; I'm exceedingly anxious to find out.

Can Five Points in Four Hours Start Error Controls?

The Taylor Report
By
Alan Taylor, CDP



The need to prevent computer errors seems to come down to the problem of providing acceptable education about controlling them. DP education currently talks about including in our application programs accounting and other controls used in noncomputerized applications, but the courses give little or no guidance about the new and really important area of handling the many and varied errors that come about as a direct result of system computerization itself.

This lack of attention, in turn, seems to result from the fact that DPers currently have no concrete, overall error-control system to offer. As a result, the vague generalities and obvious platitudes bore students to distraction and kill interest in the subject, rather than kindling it.

To start with, then, we must contend with having only a small amount of time in which to rekindle a student's attention.

Just how long students will sit still while error-control procedures are argued about seems unclear, but Honeywell's John Marshall indicated that, if the subject could be reduced to about five topics that could be discussed in four hours, there would be a chance of incorporating it into the standard DP educational programs.

He then challenged me to provide a list of those five points – or to admit that error control was simply not going to get anywhere at this time.

And since I'm not about to admit that, here are the five points I see as outlining an error-control program.

2% Error Control Cost Practical

The first point I would make is that error control *is* practical. It has been done in the past – although not very often.

Marshall indicated one site where three full-time specialists review complaints about the computerized processing area and look for the cause of the problem.

This is important because often the error itself can be stopped from recurring without ever discovering its cause. When this happens, the error-control system will have low productivity and miss its opportunities.

Low-productivity error-control systems just aren't practical; too much money is spent unnecessarily tracing new occurences and patching them. They won't hit the 2% target!

In the installation with three people, the cost of the error-control system is around 1%. (Overall budget is $5 million to $10 million.) This is certainly justifiable and reasonable. Fat budgets can lead to error-creating abuses.

A 2% error-control system is as high a cost as most normal businesses should need in normal operation, although the first-year costs might well be higher.

Who's Responsible?

My second point would deal with the placement of the task in the organizational structure. Once I felt that error control was a line responsibility because only through concentrating upon the apparently semiproductive jobs like testing and error control would anyone really understand how to run a DP department.

I argued that responsibility for the quality of testing and handling error controls should belong to the future department manager, i.e., the current assistant manager.

It doesn't work, however. If the error-control people have a significant chance to build themselves a nice cozy empire, then they will do it just like the rest of us. This leads to hopeless duplication of function and authority.

Error-control advice and counsel should come from a source that is independent of the causes of current and future problems and so should be staff, not line.

Error Control is Multiskilled

The key point about the error-control system Marshall talked about was that it was manned by three people, not just one. The problem with a single person is he normally has only a single specialized background.

Errors, caused by computerization, however, come from many places. The Honeywell one probably came from an inadequate interim form design, but it could have come from programming or a fault in a multireel sort – or from an instruction manual. There is literally no end to the areas where errors may originate.

The use of a single-speciality person to handle error control means the area concerned is asked to take on the impossible (and incredibly expensive) effort of handling all error-control functions. That certainly is not right and more to the point, it doesn't work.

By implication, this suggests error-control systems will often have to be obtained from outside the installation, making use of consultants. While there may be many skills inside the organization, it is unusual for a staff function that is truly independent of line pressures to be available with such a mixture of skills.

If this approach is implemented, however, care should be taken to ensure that the consultant does not use his function as a stepping-stone into other work within the organization. Independence is the key word here.

Overall Error Picture Needed

One of the problems in coming to grips with error control is that talk about error-control actions that have been taken can often obscure the fact that many areas are being left ignored.

The reason is that, as long as an error-control function is not in active operation, error control is simply an additional, minor function that various managers, system-analysts, programmers, operators and others have.

Naturally none of these people keep records of occurrences that do not interest their own areas. And the records that each area does keep are not organized so they can be consolidated to give a picture of the error-control situation.

Such a picture, including error incidence, error-avoidance costs, error-investigation costs, error-compensation costs, etc., is both necessary and currently unavailable in most installations, even though it is not as difficult to create on an organized basis as it may seem.

My personal opinion is that a "complaint and comment" book would provide a picture of the error-control universe quite simply.

There are other solutions worth talking about. For instance, lists of all adjustment entries in the system and an automated tracking system would certainly assist in picturing the universe in a particular application – and have the advantage of being automatic.

Something, however, is needed to show the big picture.

I have kept my fifth point till last because I can see it will be somewhat controversial.

The fact is no one likes having their mistakes known, and in general it is thought computerization errors come from mistakes.

Some of them do – but more come from the computerization process itself.

It is absolutely impossible – and logically indefensible – to ask for a business computerization project to be perfect. This is the key point that has to be brought out.

Computerization projects gain their value from their flexibility, their ability to bring the work of many specialists to bear on a particular problem before it happens. DP specialists may be good, but they are not God! They are not infallible. They work under instructions that are not beyond criticism, either.

So errors will occur in any computerized project. They occur because we cannot foresee everything and because we are not budgeted to foresee everything.

Once we admit we are overstating a little when we claim we have a perfect system, then we can start talking about the cost of control, the way of doing the job better, etc. We can let our control people write about their problems as well as their successes so that a body of knowledge is built up.

That way, we can have the cost of controlling errors in our plant supported by the work being done (and paid for) elsewhere, thus making practical our target expense figure of 2%.

Those, then, are my five points. I think they can be put over within half a day. I think they can initiate error-control programs. What do you think? Anyone with a different version to suggest is encouraged to write in.

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Plain Talk on Privacy — Part 1

What Do We Gain by Ignoring Issues?

By Daniel B. Schneider
Special to Computerworld

It is a good bet that within three years every reader of this article will be personally affected by the issue we call "privacy."

The way we design, implement, operate and manage information systems will undergo fundamental changes. For those of us who are managers, new responsibilities and liabilities will fall on our backs and, in some cases, may break them.

Yet as a body of professionals we have been reacting in the most unprofessional of ways – by trying to ignore the basic issues.

We tell ourselves and one another that we can cope with "security" but that "privacy" is the business of lawmakers, judges, civil libertarians, attorneys and sociologists – that is, everybody but us technicians.

To see better the position we are in, let us look at five specific items that illustrate what our self-imposed neutrality is gaining us.

Impact Statements

Item: The Domestic Council Committee on the Right of Privacy has developed the idea that something called a "privacy impact statement," "privacy control document" or "privacy report" be submitted for every proposed new personal information system or major modification to an existing system. This idea has found sympathy in Congress and may well become law.

(In this context and in general, read "personal information system" or "personal data system" to mean any system, regardless of technology, that contains information about an organization's employees, customers, clients and suppliers, to the extent that the latter entities are individuals; where the data is or may be identified to specific persons; and systems specifically about people, such as credit data banks.)

If the originators of this idea wanted to know how you propose to protect personal data, they would have called it a "security statement."

If they merely wanted to know who will have what access to personal data, they would have called it a "system description."

What they in fact are asking for is a catalog of all the possible damages that an employee, customer, credit-seeker, etc., might suffer as a result of the normal operation of the proposed system, plus all of the possible damages that might flow from such unplanned events as negligent or malicious use of system data.

This is a "what could go wrong?" exercise with a twist we had better examine closely: It requires the participants to make value judgments about people.

In fact, the whole idea of privacy statements is a bureaucratic reaction to frustration. Its proponents are really saying, "We can't define privacy standards for a technology we don't understand, and because you technologists are not helping us we'll just put the monkey squarely on your back."

Data Classification

Item: Most of the privacy bills that have been introduced in Congress this year call for categorization or classification of information.

Classification appears to be seen as an aid to the development of security controls; presumably we would have some hierarchy of security controls which would correspond to a ranking of elements of personal information according to sensitivity.

The very notion of sensitivity is based on the damage that could flow from misuse of data, but damage is something done by people. The extent of damage is a function of many factors including, but certainly not limited to, the number of individuals damaged and the vulnerability of those individuals.

The determination of sensitivity has to be a function not only of the information element but also of the persons having access to it and of the time, place and circumstances of the access. One such circumstance is the combination and/or order of elements accessed.

Thus, sensitivity is dynamic, and a given data element might well appear in every one of the classification ranks.

Now superimpose this on your current systems and on your IMS and Total data bases and you should see the first reason for objecting to classification.

The second reason why categorization is a mistake is ethical. Privacy is bound up with individual dignity and freedom. For years we have been accused of undermining the individual by reducing him to an impersonal number and statistic; will we continue to rob him of his individuality by trying to put those things that define him as a person into segregated boxes?

Third, and most serious, classification requires a third-person value judgment. Who of us is so arrogant as to say that our neighbor's marital status is a category eight sensitivity and his bank account number is a category two?

Item: Much of the present draft legislation embodies a safeguard proposed last year by the HEW advisory committee that says whenever personal information is collected it be for a specific purpose which has been made known and that the information not be used for another purpose without the individual's consent.

While no one is likely to object to this idea, the definition of "purpose" is critical. If "purpose" is defined in sweeping generalities, it will make a mockery of the safeguard. If "purpose" is defined in the narrowest sense, it will drastically impact our systems and our developing data base technology.

Undefined Mandates

Item: Almost without exception the proposed laws contain mandates for reliability, accuracy, completeness, timeliness and pertinence of personal information maintained in systems.

Needless to say, these good things are not defined. But the existence of wrong, incomplete, untimely or nonpertinent data in one of your systems could result in an action for damages and an injunction brought against you and/or your organization by the affected employee, customer, credit subject, etc.

Item: We DP types have existed in relative obscurity in our organizations. There has generally been a buffer – in

(Continued on Page 14)

Viewpoint

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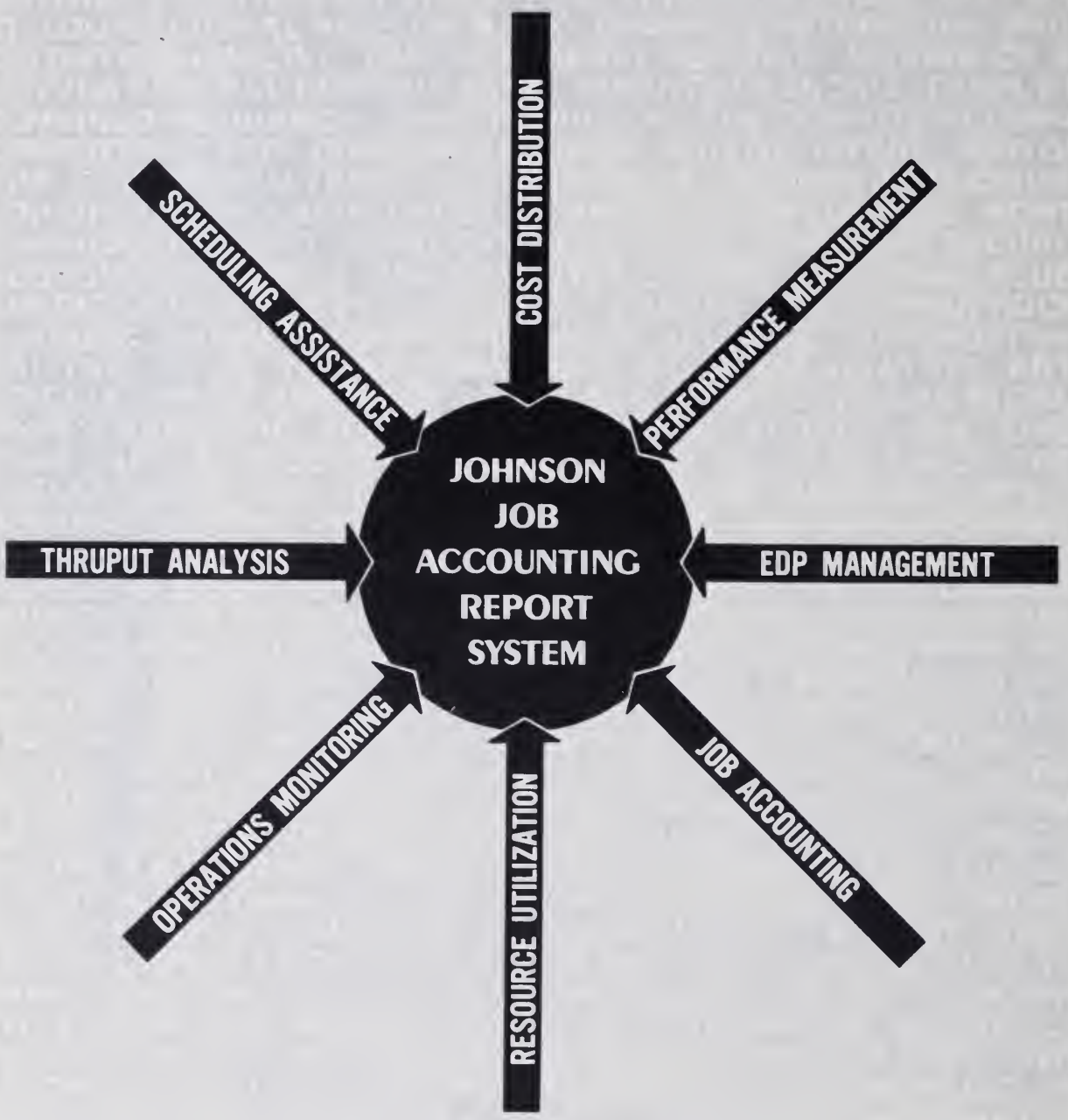

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Letters to the Editor

'Smart' Cross-Reference A Useful Option

R.A. Sobieraj's suggestion [CW, Oct. 9] of a "smart" assembler cross-reference (listing only the symbols referenced rather than all symbols defined) would be a useful option. Cobol and other higher-level language programmers could also benefit from this feature.

Additionally, a "smart" cross-reference might include XREF ON/OFF (allowing areas of a program to be explicitly excluded from the cross-reference), differentiation between store (MOVE TO) and fetch (MOVE FROM) references, local cross-references for certain areas of the program and better tabulation of assembler register references.

If there is sufficient interest, we will develop a "smart" cross-reference feature for our source program editor, The Sorcerer [CW, Aug. 28]. Interested parties should communicate their suggestions to us.

Charles A. Mills
Marcus Powell Associates
2694 Doidge Ave.
Pinole, Calif. 94564

What Can We Gain By Ignoring Issues?

(Continued from Page 12)

some cases a director of employee relations or a vice-president for customer service – between us and an irate employee, customer, etc.

Now that lawmakers will be requiring public notice of our organizations' personal information systems, including the business address and telephone number of the "person immediately responsible" for the system, what is the outlook for our involvement? Is the vice-president of sales "immediately responsible" for the accounts receivable system or are you?

These items point out some important lessons for us:

- Many of the people framing privacy policy are approaching the problem by a combination of vague palliatives and shifted responsibilities.
- Privacy policymakers are not immune to error and are quite capable of proposing cures that are as bad as the disease.
- Privacy policymakers generally have little understanding of our profession and its technology and figure that, in any event, we are not the ones they are looking out for.

Who is looking out for us? Who is advising the government executives and policymakers when they get on the wrong track?

Schneider is an information systems specialist in Washington, D.C. In Part II, he offers some answers to the problems posed above.

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Move to Major Application Package Takes 3 Years

By Nancy French
Of the CW Staff

HARTFORD, Conn. – While some users may think buying a program package is the simple solution to a problem, systems analysts at The Hartford Insurance Group who recently adopted IBM's Advanced Life Information System (Alis) will testify it takes a lot of planning and testing to make one work.

The company allotted three years for planning and testing and spent $2 million on its conversion. The effort, which involved transferring 230,000 insurance policies previously processed on an IBM 7010 tape/batch system to a combined data processing and teleprocessing network, spawned paperwork changes in every department of the company.

With the new system, all routine transactions are handled and inquiries from CRT terminals in the field get responses within seconds.

Night batch runs update every policyholder's file and automatically notify him of any activity on his policy with one of 29 stock computer-printed messages.

But the conversion didn't happen overnight.

Jerry Tompkins, assistant director of the DP Systems Department, explained the conversion was a "user-oriented project" from the start.

The project team developed and ran a model system and, by examining the results, they determined what modifications were needed.

"We used the Project Control System (PCS) as a project control aid," Tompkins noted.

"About 1,800 tasks that had to be accomplished were defined to the PCS system. Then the tasks were put into a network of dependencies," he explained.

Biggest Problem

"The greatest single problem we had," Tompkins said, "was cleaning up the existing records so that the new system would not reject them. Our records were incomplete, and their age and accuracy were not what they should be."

The company did "mini-conversions," file by file, in modest bites, according to Tompkins, because it "involved an awful lot of machine time.

"Each time we'd take a look at the fallout, and then the users had to dig in and make corrections," he explained.

Late in December 1973 all processing under the old system was stopped, and activity reports began accumulating. By Christmas pilot conversions showed a success percent rate high in the 90s, according to Tompkins, and Hartford was ready for the final conversion of data.

From the start, the company "jumped off into the dark" fully committed to the new system. No dual system was used, Tompkins said.

"As soon as we converted, we began a series of catch-up cycles to work off the backlog," he explained, and the system has made life easier for users ever since then.

While IBM gave employees some training in the early stages, The Hartford hired consultants to convert IBM's DOS version of Alis to OS.

In addition to policyholder inquiries, the system's data retrieval capacity helps speed up policy loans, commission computations and actuarial calculations, Tompkins noted.

The new program is run on the same equipment as The Hartford's Total Information System (TIS), introduced two years ago in the automobile and homeowners lines. The system employs 300 terminals in 50 locations tied directly to the home office where three 370/158s, each with 2M bytes of memory share processing chores with one 3M-byte 165.

Tompkins said he expects the system to have a five-year life span and new products will have to be "bent" to work on the existing system rather than changing or replacing the system.

'Heals II' Eases Maintenance For Larger Honeywell Systems

WELLESLEY, Mass. – Honeywell has announced two packages designed to simplify maintenance and improve transaction processing capabilities for its large-scale systems.

The Honeywell Error Analysis and Logging System (Heals II) provides advance warning of potential hardware malfunctions.

The Transaction Driven System (TDS) provides Series 60 Level 66 and Series 6000 users with communications programs necessary for simultaneously processing heavy volumes of transactions from a large number of remote terminals.

Most failures in computer systems start as intermittent errors that can be corrected immediately through retry and recovery techniques. Although the user is not generally aware of the errors at first, the retry and recovery techniques tend to decrease system throughput and increase in frequency until they are no longer recoverable. Heals II pinpoints the errors so they can be corrected before they reach this point, Honeywell said.

Heals II is an update of the earlier Heals I system and provides more analysis of total systems – including peripherals and storage media as well as processors and main memories, a spokesman said.

Heals II is available immediately at no extra charge to all Honeywell Series 60 Level 66 and Series 6000 customers with Honeywell maintenance contracts.

TDS, the other new package, is a communications "executive" that coordinates the receipt and dispatch of a virtually unlimited variety of computer terminal messages with information required from a common data base.

It is said to be completely compatible with other Honeywell data and communications control software for large-scale systems, including the Remote Terminal Supervisor and Network Processing Supervisor.

TDS benefits include high throughput and short response time for heavy on-line traffic; maintenance of system and data base integrity without degradation in performance; fast recovery in case of equipment or software failure and concurrent access to a large common data base without interference for retrieval and update operations, according to Honeywell.

TDS is available immediately to Honeywell customers at a monthly lease price of $1,000.

'Score-11' Interleaves PDP-11

ORINDA, Calif. – Still another real-time executive system is now available to DEC PDP-11 users with the announcement of the Score-11 package from Virtual Memory Systems.

Score-11 supports process control, data acquisition and data communication environments, but it also serves as a basic building block for time-sharing and general multiprogramming operating systems, the vendor said.

Priority Scheme

The software provides multiprogramming capability on an interleaved execution basis. Individual programs or tasks may operate independently or together to accomplish processing objectives.

Software priorities are used to select which task to run in the event two or more tasks are simultaneously competing for CPU use or other shared resources.

System tasks supported by Score-11 include a means of communication between the operator and the Score-11 executive itself.

Subroutines

Another system task copes with power failure/recovery including a display of the time and date of each failure. Internal and external interrupts are monitored by the fifth system task, a spokesman added. A reentrant subroutine library, meanwhile, provides extended arithmetic and code conversion facilities.

A minimum Score-11 hardware configuration consists of a Digital Equipment Corp. PDP-11 CPU with 8K memory, a line frequency clock, an asynchronous serial interface and a console keyboard/display device.

Score-11 relocatable object modules are available for $2,400, while source code is $600, from Suite 3, One Northwood Drive, 94563.

16-Bit Mini Runs Multitasking

OCEANPORT, N.J. – The total number of concurrent tasks, both foreground and background, that can be controlled by Interdata's OS/16-MT operating system is limited only by the amount of memory available on the user's 16-bit mini, the vendor claimed.

The system is designed for original equipment manufacturers and end users with industrial automation, process control and laboratory applications. The multitasking support allows the system to run foreground application tasks and background program development work simultaneously, Interdata noted.

OS/16-MT has four categories of tasks, from system functions through foreground and resident background tasks, and ending with transient tasks. Transient tasks and overlays for the higher level tasks are loaded from the system's disk storage library.

In use, multiple application programs operate concurrently on an interleaved basis, but up to 16 levels of priority determine task execution sequence. The console operator can communicate with tasks and intertasking commands permit task-to-task communication, the company added.

I/O operations are programmed through Supervisor Call instructions, which pass appropriate parameters to the OS/16-MT system. I/O operations are device independent, the vendor noted, with device selection made at run time without being dependent on user application coding.

User coding can be in Assembler, Fortran IV, Fortran V or an extended form of Basic. Fortran V is an extension of Fortran IV which produces Assembler source code as output and is designed for operations that cannot be handled easily with conventional Fortran IV.

OS/16-MT programs can be upgraded easily to run under either OS/32-ST or OS/32-MT environments on Interdata's 32-bit machines, the company said.

OS/16-MT itself requires only 4K to 12K bytes of memory. It will run on any 16-bit Interdata mini with 16K bytes and it supports Interdata's complete line of standard minicomputer peripherals, the company noted.

The system is available now for $950 from Interdata, 2 Crescent Place, 07757.

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Parameter Cards Shape Payroll, Personnel Work Done by 'Q-Pac'

ANDOVER, Mass. – With help from the DP staff, clerks in end-user departments may be able to set up and then modify as needed the processing done by the Q-Pac Payroll, Personnel and Labor Costing System, available now in the U.S. and Canada from Software International.

The system is controlled through entries on "question-and-answer" style coding sheets which become, after keypunching, a set of parameter cards. Multiple sets of control cards can be used during a single run of the program, allowing each division within a company, for example, to be handled differently.

The Q-Pac system includes several modules covering payroll processing, tax calculations, personnel recordkeeping and labor cost accounting. In addition, the system has both an extraction subsystem and a report writer module support user needs beyond the parameter-selectable "menu" of standard reports.

A general ledger interface, mailing label subsystem and check reconciliation subsystem complete the application-oriented portions of the Q-Pac system.

The payroll processing routines support a broad range of wage and salary schemes, deductions and payment methods.

The personnel recordkeeping subsystem can be as simple or complex as the user wishes, through the use of variable-length records. Records can be extended to a maximum of 2,640 bytes for each employee through parameter card changes and the entry of the new data. Such changes will not affect processing previously defined by control card sets, the vendor noted.

Q-Pac is designed to operate on IBM 360/370 equipment. The largest of the 34 programs in the system is 45K under DOS and 75K under OS. The system is coded in Cobol and Assembler and sells for $25,000 (DOS) or $30,000 (OS).

Maintenance of the tax module is separately priced after the first year at $1,800/yr, a spokesman said from Elm Square, 01810.

Program Goes With Tape, Disk

SANTA CLARA, Calif. – Users buying a year's supply of tapes and disk packs from Memorex are offered a free software package, Procedure Library Scanning (Procscan), which converts tape and disk data sets as they are shifted to more advanced media.

The package reduces "significantly" the time normally required for modifying the files by eliminating manual Job Control Language (JCL) changes. It also relieves programmers of the chore of scanning printouts of JCL procedures to identify which members require changes, Memorex said.

When upgrading from an IBM 2311/2314 to an IBM 3330 environment, from Memorex 3660 to IBM 3330 or from Memorex 3660 to Memorex 3670, Procscan reallocates data set space in accordance with the tighter packing densities of the advanced drives, a spokesman explained.

By extending the package beyond its original purposes, users are able to identify all occurrences of a specified character string through one parameter card entry and, with another card, to change them.

Reports generated by Procscan include an updated "proc" list, a conversion exception list (with data sets that were not converted because they would occupy less than a half track on the new device) and a Procscan monitor list. In addition, the system documents the reason for each conversion.

Memorex is at San Tomas and Central Expressway, 95052.

Hospitals Go On-Line With NCR's 'Medics'

DAYTON, Ohio – A computerized communications system for hospitals called NCR Medical Information and Communications System (Medics) was developed for hospitals in the 200- to 800-bed size range and provides on-line data collection, message switching and inquiry capabilities.

The system is designed to work in tandem with a second NCR computer system devoted to routine batch processing. The second system also provides backup for the on-line system.

Medics serves six functional areas of the hospital – fiscal, nursing, professional, general and administrative services and medical staff communications.

Minimum hardware for the on-line system consists of an NCR Century 101 computer with 64K memory and communications capability plus a combination of NCR 275 hospital terminals with automatic wand readers, NCR 260 general communications terminals, and NCR 796 CRT terminals. A 64K Century 101 is also the minimum configuration for the batch system.

In the on-line system, data is collected as services are ordered for the patient. Services are automatically priced and posted to the patient's record. As needed, the information is routed to other areas of the hospital, the company said.

Open Messages

Terminals can also be used by the medical staff for sending open-format messages to other departments. Selected data collected on-line during the day can serve as input for subsequent batch processing.

Deliveries of the new system will begin in December. The software licensing fee for Medics, including installation and maintenance, is $1,080/mo for 60 months, $1,800/mo for 36 months, $5,400/mo for 12 months or a one-time payment of $60,000.

The total cost for both an off-line batch processing system and the Medics on-line communications system, including hardware and software, will range from $2.50 to $3.50 per patient day, NCR estimated.

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Cash Control Added To Leasco Library

GERMANTOWN, Md. – Small and medium-sized companies in any of a dozen metropolitan areas across the country may be able to analyze and control their payables by utilizing the Cash Disbursement (C/D) system now installed on the Response I service of Leasco Response.

Response I service is implemented on Hewlett-Packard minicomputers located in various Leasco branch offices. Programs such as C/D, therefore, are not designed to provide a single data base accessible to multiple geographically disbursed locations of a user company, a spokesman said.

C/D permits management of the liability cycle, from entry of the unpaid invoice and other documents, through check reconciliation, he said. The system provides for both permanent and temporary vendors and is designed so that open items can be entered directly from the vendor documents.

Leasco has developed the cash disbursement system to be compatible with the general ledger accounting system, also installed on the Response I HP minis. Transaction entry tapes can be generated for C/D users who also have the ledger system, the company noted.

Response I – and the C/D system – is interactively controlled from teletypewriter terminals in the user offices linked to the Leasco office over the public telephone system through acoustic couplers.

C/D is available for normal Response I time charges, with a $100/mo minimum, after payment of a one-time $100 fee that covers installation of the software, help in setting up files and training of user personnel.

Leasco is headquartered at 20030 Century Blvd., 20767.

4800 Calculator From Victor Provides Key to EDM System

MARBLEHEAD, Mass. – A desk-top "computer" system to give managers easy-to-use forecasting facilities, the Evaluative Decision Mobility (EDM) system, consists of a programmable Victor Comptometer 4800 calculator and a library of software routines developed by Zircon Co., Inc., the company marketing EDM.

The 30 or so programs include corporate performance modeling, manufacturing cost analysis, financial studies and profit-and-loss and other budgeting applications. By putting this kind of information in managers' hands (almost literally), EDM provides more decision-making support than many mainframes or intelligent terminals, Zircon claimed.

The Victor Comptometer 4800 has a capacity for 1,000 steps of program logic independent of data storage plus a number of registers for control and accumulation of totals.

EDM, including the 4800, costs from $3,000 to $5,000 depending on programs in the system and can be ordered through P.O. Box 501, 01945.

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'DIS' and Controllers Tie VS-Oriented 370 To Sensor-Based S/7s

WHITE PLAINS, N.Y. – Sensor-based operations of one or more IBM System/7s can be combined with the general-purpose capabilities of a VS-oriented 370 to create a hierarchical network with the Distributed Intelligence System (DIS) control program from IBM, the company said.

Operating under DIS, applications at the central computer can be activated by one of the satellites, while System/7 programs can be started either by the 370 or by any of the satellites.

Data from any computer can be transferred to any application program, IBM added.

The network created under this control program may link as many as 64 satellite System/7s to a sensor-based control unit at the host computer. Additional control units may be installed, IBM noted, to increase the size of the net.

With DIS, a host computer can, for example, monitor and control the activities of System/7s on a manufacturing floor, easing the coordination of equipment, manpower and materials and providing up-to-date operating reports.

The new control program operates with 370s, Models 135 through 168, running under OS/VS1, and with System/7s running under Modular System Programs/7.

Applications may be written in PL/I and Fortran for the 370 and Fortran or Algol for the System/7, IBM said.

Each System/7 must be equipped with a sensor-based control adapter which connects to a control unit at the host computer. The control unit can transfer data at a rate of 277,777 byte/sec over distances up to a mile, the spokesman claimed.

IBM foresees users installing two copies of DIS, one to run on-line applications while the other is used for off-line programming tests.

While the DIS software will be available free, with first shipments next February, the control adapter for each System/7 will cost users $5,200 or $130/mo.

The control unit for the 370 will cost $35,000 or $875/mo.

What the Bell Is Going On?

MONTREAL – "In the old days, when we worked under a single operating system, a bell would ring when the system crashed," a Sigmerics member told his friend, "but we recently put up VM/370, with some strange results.

"I was near the console one day when things got very quiet. The system had crashed, but there was no bell. Suddenly the console typewriter started and spit out a one-word message: 'RING.'"

In the laughter that followed, the friend tried to console the original speaker. "You're lucky the system didn't just generate a coded error message. Then you'd have had to go to a manual to find out that the message meant 'RING.'"

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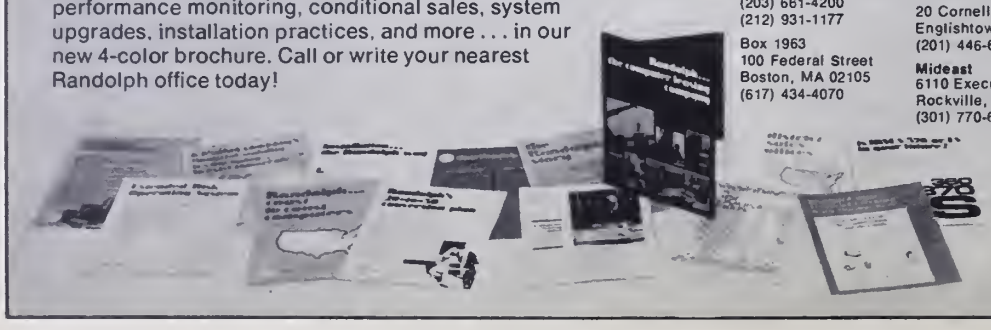

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DP DIALOG

Notes and observations from IBM which may prove of interest to data processing professionals.

DP DIALOG appears regularly in these pages. As its name suggests, we hope DP DIALOG will be a two-way medium for DP professionals. We'd like to hear from you. Just write: Editor, DP DIALOG, IBM Data Processing Division, White Plains, N.Y. 10604.

Dan Heintz discusses career objectives with LaVatryce Jones after she has run through a computer-based career program.

The Search for the Right Career

Choosing a career is a difficult decision most students confront sometime during their education. For many the decision is often based on inadequate information on the number and variety of career opportunities and generally insufficient knowledge of the educational training needed for each.

Students at 75 schools across the country are getting help from an innovative program called the Computerized Vocational Information System (CVIS). It was started in 1967 at Willowbrook High School in Villa Park, Illinois under the direction of Dr. JoAnne Harris. An interactive system, CVIS enables students to compare their own abilities, interest and grades with information on some 500 different occupations.

Using the Willowbrook system as base, Proviso Township High Schools, just outside of Chicago, further developed CVIS to make it function as a total data base. On the East campus, 3,800 students are using CVIS. An additional 4,400 students are served on the West campus.

At visual display stations, students answer preprogrammed questions and indicate their interest in various career opportunities. The school's System/370 Model 135 checks constantly to see if they are on the right track.

Dan Heintz, Vocational Counselor at Proviso East, says, "The system has already helped our counseling effort immeasurably. Instead of spending time hunting for information, our counselors can now concentrate on counseling. They also have access to up-to-date information on a wide variety of careers."

Besides keeping track of career opportunities, CVIS also provides information on some 1,600 colleges, as well as specialized and technical schools. "By the end of the year," says Howard Schumacher, Director of Management Information Services for Proviso Township High Schools, "the system will also include information on financial aid and local jobs."

"CVIS gives our students a chance to see the number of careers available to them and helps them focus on their own potential and interest," says Dan Heintz. "We hope that information provided by this system, together with our own counseling efforts, will help steer these students in the right direction." **IBM**

Computer Aids Children of Migrant Workers

Billy is in the fifth grade classroom for the second day in Thomasville, Georgia. His teacher knows he has a way with numbers, difficulty reading either English or Spanish, and has a 20% hearing loss in his left ear—probably because of a case of measles he had when he was six.

Two years ago, it's likely that the school wouldn't have known a fraction of this, and by the time it pieced together his background and took the first definitive steps in helping him, Billy would have been on his way to a new town, another school, and possibly the gloomy prospect of facing still another set of academic obstacles.

Today, Billy, the son of migrant farm workers and one of an estimated 900,000 such children in the United States, not only stands a better chance of completing his education, but can learn there are ways of earning a living other than working in the fields.

Because of a computer-based communications network called the Migrant Student Record Transfer System (MSRTS), Billy's education and medical records can now keep up with him.

The system is the result of a joint project between the federal government and the State of Arkansas, which started in 1968 on an experimental basis. It now enables 8,000 school districts throughout the United States to obtain current scholastic and medical histories of more than 400,000 registered migrant children. These records are stored in an IBM System/370 computer in Little Rock, Arkansas.

Using teleprinters linked to the central computer by telephone lines, authorized school districts can get needed information in a matter of hours. The records of each student are updated by means of the same equipment.

"The problem of educating migrant children is quite complex," says Winford Miller, the system's administrator. "Schools along the country's three main migrant streams often have no way of knowing what subjects have been studied and what grade levels were achieved. Moreover, health records are often incomplete or non-existent."

"With the availability of MSRTS, at least a promising start has been made," says Miller. "It's only a small advance but it has large implications. Certainly it means the nation's migrant children have a better shot at schooling than they had before." **IBM**

Advertisement

Reading the Navajo Way

Learning to read can be difficult for any child. But learning in an unfamiliar language is an even greater struggle—one which 53,000 Navajo children must face every day.

These children are part of the largest Indian tribe in the United States—over 130,000 people living on a reservation which spans parts of Arizona, New Mexico and Utah. They attend school mainly staffed with teachers who don't understand Navajo and who are teaching Navajo children who don't understand English.

To help solve this educational dilemma, Dr. Bernard Spolsky, director of the Navajo Reading Study at the University of New Mexico, has undertaken a project which will set out first to train Navajos themselves as teachers. Secondly, it will develop Navajo reading materials with the help of a computer so the children, when they first enter school, can learn in their own language.

"Then," says Dr. Spolsky, "once they have learned to read in their own language, a language they understand, they can begin to learn English in, say, the second or third grade.

"The computer enters the picture with the development of the Navajo reading materials," says Dr. Spolsky who is also a professor of elementary education, linguistics and anthropology. "To develop effective first grade readers, it is not enough to know the child speaks Navajo. You must know in detail how he uses the language—what words he doesn't use, what words he uses and precisely how he uses them.

"To uncover this information we interviewed over 200 Navajo children on the reservation—in their homes and at school. There were no restrictions on subject matter: home life, coyote tales, space ships, whatever came up."

The material was then keypunched for processing on an IBM system at the university. "At this point we had a body of speech of over 11,000 sentences, 53,000 different words and 8,775 different word types. Computer processing made it possible to do our analyses on as large a data base as we could gather in the time available."

The computer was able to run several analyses on this amount of data. It prepared a concordance, or an alphabetical index of all the words used in the interviews in context of the sentences in which they occurred. Then it ran frequency studies by word and word type, studies of individual letters and letter units and analyses of vowels and consonants. "All of these reports were extremely useful in providing the basis of language intelligence for planning reading materials geared to the language the child is speaking."

The results of the complex computer analyses are 13 new books, mainly for the first grade reading level but some also for the intermediate and advanced levels. Dr. Spolsky recalls a typical story in one of the primers. "It has to do with the children and the school bus. The children board the bus, a rabbit gets on, a coyote gets on, then a skunk gets on, sits down, emits his characteristic odor. Very quickly the driver stops and everyone gets off. It has an element of humor for the six-year-old, and also a kind of introduction to fantasy, all in terms familiar to the child."

In addition to the reading primers, the Navajo Reading Center has brought out ten publications that are reprints of older selections from Navajo history, long out of print.

"Could we have done without the computer? Concordances done manually are monumental projects. We just couldn't have taken it on. In addition to our bilingual education work, the file in the computer provides the basis for another thrust—the study of the Navajo language development process.

"In 1940 the Navajos used virtually no English words and only a handful of Spanish words. Of the 53,000 words we have now classified, 500 are loan words from English. So the language situation on the reservation has changed somewhat in the past 30 years.

"Even so, the Navajo language has remained remarkably pure. In 300 years of contact with the Spanish, the Navajos borrowed only 30 to 40 words. There's something about the spirit of the language. They traditionally have not borrowed words, preferring to compound their own to deal with new entities."

In any event Dr. Spolsky feels there is a special satisfaction in helping maintain a vibrant, living language and in combining basic research with actual teaching activities, using the most advanced technology. **IBM**

Computing Pioneers: Part II

In an earlier issue, DP DIALOG traced the evolution of calculating devices from the abacus to the late 19th century. A number of readers asked that the story be continued. So, here are a few more of the events that led to the modern computer.

An automatic punch card sorter (1910).

By 1890, a growing nation and its expanding industrial economy were producing numbers, figures, and statistics in profusion. No longer was the census merely a matter of counting heads, for example. By 1890, it had been expanded to include statistics on immigration, race, health, literacy and employment. It was clear the government needed an efficient way to tally this wealth of information.

Herman Hollerith, a Census Bureau statistician, solved the problem with the first electrical tabulation machine. Fast and accurate, it used cards in which holes were punched to represent vital statistics. Systems like it earned growing acceptance throughout the next thirty years, although they were modified and speeded up to handle the ever-increasing needs of the government, business and scientific communities. To accommodate more information for business use Hollerith increased the size of the punched card itself. As his design model, he chose the dollar bill of the time.

Between 1900 and 1910, railroads began using "Hollerith machines" to tabulate waybills. Insurance companies, with actuarial statistics to correlate and mortality predictions to make, were quick to see the advantages of mechanical tabulation. And public utilities, with countless customer records to maintain, also turned in growing numbers to machine accounting. More sophisticated methods—such as cost accounting and sales analysis followed.

With the United States' entrance into World War I, the Wilson administration set up a plethora of public agencies to control transportation, communication, manufacturing and distribution. Under Bernard Baruch, the War Production Board established committees on commodities as diverse (and unlikely) as baby buggies, biscuits and crackers, and pocketknives. To operate effectively, these agencies needed rapid access to vast quantities of information, and thus installed large numbers of tabulating machines.

By the thirties, many large firms had established a "tab" department, but it remained for the government to undertake the largest bookkeeping job ever. The Social Security Act of 1935 made it necessary to maintain employment records on 26 million people. To handle this task, a production line punched, sorted, checked and filed 500,000 cards a day.

By the mid-thirties technology had advanced to the point that mechanical reading, writing and arithmetic were available—but separately, as individual functions of distinct machines.

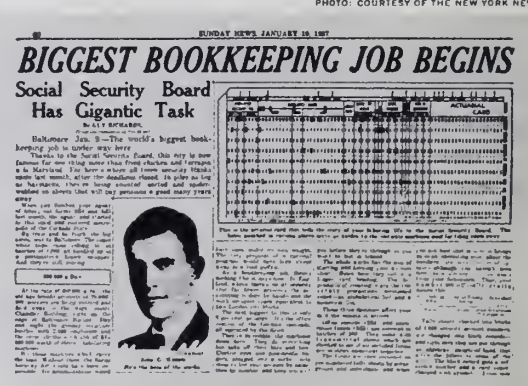
From the 1937 master's thesis of MIT student Claude Shannon came a way of using symbolic logic to improve electrical switching circuits. In one example, he showed how to automatically add two numbers using only relays and switches. Although any numbering base could be used, Shannon said, the circuit would be greatly simplified by adopting the base two.

That same year, working independently, George Stibitz of Bell Labs built such an adder in his home. He called it the "Model K", after the kitchen table on which it was constructed.

At about the same time, Wallace Eckert of Columbia University used a mechanical programmer to link together different kinds of punched card and accounting machines to allow complex astronomical calculations

Such developments foreshadowed many of the advances of the next decade. As early as 1937, Harvard graduate student Howard Aiken had proposed that a new kind of calculating machine be built. It was later to become known as the Mark I, the first automatic, general purpose digital calculator.

PHOTO: COURTESY OF THE NEW YORK NEWS



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This article said of the IBM collators, "They're incredible. They do everything but take off their hats and bow."

During World War I, the Army used punched-card sorters in the first large-scale application of psychological testing.

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Data Briefs

Informatics Division to Provide 'Hilo' Optimization Program

FAIRFIELD, N.J. – The nationwide availability of an application data service capable of pricing charges for the restructured AT&T private-line rates has been announced by Informatics, Inc. Data Services Division.

The Informatics Hilo Optimization Program is designed to minimize monthly telecommunications costs; identify optimal high density homing point centers; locate compter centers, PBXs and concentrators; compare high density and low density routes, digital data systems and specialized carrier services; optimize Wats, FX, DDD and private-line networks; and provide private-line inventory control.

The program also provides network cost optimization for IXC and Telpak users. Another feature is the capability of storing circuit, channel termination, service termination and conditioning charge details for billing comparison, the company noted.

The service, developed by DMW Telecommunications Corp., is available on a time-sharing or remote entry basis via multiplexer sites located in Boston, Long Island, New York, Washington, D.C., Atlanta, Cincinnati, Chicago, Dallas, Los Angeles and San Francisco. It costs $40/connect hour, a spokesman said.

Tycom Has Typewriter Attachment For Intelligent CRT terminals

FAIRFIELD, N.J. – A typewriter attachment for intelligent terminals with CRT displays is now available from Tycom Corp.

The Tycom Model KSR-38 can be used with any available CRT terminals which have an RS-232 output. It is compatible with CRT terminals manufactured by Delta Data, Teleram, Datapoint, Ontel and others, Tycom said.

The system includes a customer-supplied IBM Selectric typewriter and Tycom electronics. The depressed keys of the Selectric are converted to Ascii code and the data is then transmitted at a rate of 15 char./sec.

Copy can be prepared on the Tycom or CRT terminal keyboards or can be drawn directly from a computer for editing on the CRT display. The revised copy can then be printed in hard-copy form on the Selectric or stored in the computer for later use, the company explained.

The KSR-38 offers the user a standard Selectric typewriter, including upper and lower case, 110- or 130-character write line, interchangeable type fonts and hard copy plus as many as 10 copies.

Price is $2,350 for the Model KSR-38, not including typewriter, from 26 Just Road, 07006.

Regulatory Procedures Unclear

Tymnet: Packet-Switched Net in Disguise?

By Ronald A. Frank
Of the CW Staff

CUPERTINO, Calif. – As most users still look forward to utilizing the first packet-switched networks, there actually is a company that has been offering this type of service for some time.

Tymshare, Inc. does not talk about packet switching, but it does admit that it provides "character switching" on its Tymnet network which serves users in this country and Europe.

The forerunner of the packet-switched nets was the Advanced Research Projects Agency (Arpa) network, funded by the Department of Defense, which now links major universities and research institutions. Tymnet is directly compatible with the Arpa net and in 1972 the two communications systems were linked together for a demonstration of the packet-switching methodology.

Complications Abound

Tymshare is primarily a time-sharing company that has configured its network to help implement its services. But things are not quite that simple in the world of regulatory procedures. Telenet Communications, Inc. plans to begin offering packet-switched or value-added service to users early in 1975. And Telenet will operate as a common carrier meaning its rates will be approved by the Federal Communications Commission (FCC).

Some observers feel Tymshare is closer to being a carrier than it likes to admit. The key question is whether the communication lines are provided simply as an enhanced or value-added line facility, or whether the lines are part of a DP-related service. These observers point out that Tymshare can operate with much more flexibility in rates if it is not regulated. And some charges have been raised that the firm offers different rates to different customers under contractual agreements. None of this is illegal for a nonregulated company, but it might give Tymshare an unfair advantage over potential rival packet-switched services companies such as Telenet on Packet Communications, Inc.

The question of different contractual rates is firmly denied by William Coombs, Tymshare's director of marketing. He said all customers pay equal rates and the only variations apply to two Tymnet customers who pay more than $20,000/mo in services. These customers get a volume discount which is available to all who qualify.

But Coombs has acknowledged that the regulatory question could be a problem and at a recent conference dealing with communications networks, he admitted Tymshare had an FCC application to become a carrier already prepared if such a need should arise.

From the user's standpoint, it now appears that Telenet rates will be below those of Tymshare. Telenet is now talking about $2/hour while it costs about $3/hour on Tymnet. Exact comparisons are still difficult because these figures do not include the processor that is required by a high-volume user to access a value-added network. A Tymcom III on-site mini costs $2,150/mo, for example.

Officially Tymshare is operating under

Analysis

the joint use provisions of FCC tariff 260. In a recent letter on this subject from AT&T Long Lines, the phone company said, "It is our opinion that the fee charged by Tymshare to joint users for data message switching is outside the scope of our tariff responsibility."

The letter is also stated that Tymshare would be classified as a "composite" data service vendor, a term coined by AT&T that applies to value-added carriers. Interestingly Telenet services will also be classified by Bell with the same title and will pay the same rates. Clearly there is a reason why AT&T calls these companies vendors instead of carriers.

One of the main advantages for users is that the packet-switched companies are planning to offer higher-speed services. Tymnet currently handles relatively slow-speed terminals that operate up to 30 char./sec. But in March 1975 it will replace the Varian 620s and 73s with Interdata 7/32 minis. This will upgrade the network to handle 2,000 bit/sec terminals including IBM 3780s and Data 100 equipment, Coombs said.

The 7/32 is a 32-bit mini introduced last year by Interdata. Other equipment now in the Tymnet system includes Xerox 940s, Decsystem-10s and a 370/158. Applications include about 70% commercial business usage including financial and statistical jobs.

In mid-1976 Tymshare plans a further upgrade with Interdata 8/32 minis and then the net will support all terminal equipment up to 9,600 bit/sec, Coombs said. Interdata has not yet announced a machine called the 8/32.

Tymnet uses all Bell facilities including modems but Coombs said that could change. Earlier this year Tymshare line charges dropped about 15% when the network was shifted to the high/low density rate structure and a further savings might be possible if Bell's DDS service goes into effect, Coombs said.

At current rates a user with about 1,000 hours of usage per month pays $7 to $8/hour on Tymnet, $19/hr on Wats lines and $28/hr on dial-up facilities, he estimated. Asked if he planned to incorporate specialized carrier lines into Tymnet, Coombs said he is considering such a move. One of the drawbacks is that the specialized carriers do not yet have the alternate routing capability required by Tymnet, he said.

Paradyne Details M-96 Lease Plan; Upgrades PIX Remote I/O System

LARGO, Fla. – Paradyne Corp. has announced a lease plan for its recently introduced 9,600 bit/sec modem line.

The M-96 is an all-digital modem implemented in MOS/LSI and TTL which operates on four-wire private lines at 4,800-, 7,200- or 9,600 bit/sec. The modem is designed for 9,600 bit/sec operation on Series 3002 lines with D-1 conditioning recommended.

The lease plan offers both two- and three-year terms. On a three-year plan, the basic modem with local and remote test features rents for $150/mo. Prime shift maintenance is available at $25/mo.

Two-channel and four-channel multiplexer options provide five different combinations of 2,400-, 4,800- and 7,200 bit/sec data streams. These subchannels can be connected directly to terminals at the same site as the M-96. The subchannels can be extended to remote sites by means of lower-speed modems.

Paradyne has also upgraded the modular PIX family of remote I/O systems to run at 9,600 bit/sec.

The PIX family is an end-to-end communications system for IBM 360/370 users that provides remote job entry (RJE) capability without the need for special communications software or conventional communications controllers and data sets, the company said. The 9,600 bit/sec PIX system can drive remote, high-speed line printers and card readers.

Typical Price

A typical PIX system including two 9,600 bit/sec modems, one 600 card/min reader and one 1,100 line/min impact printer leases for $2,380/mo, including prime shift maintenance. When the transparent data compression option is included, the 9,600 bit/sec PIX system will exceed the throughput achieved by most conventional RJE systems using 19.2 Kbit/sec wideband lines, the firm claimed.

Delivery is 90 days from 8550 Ulmerton Road, 33540.

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Computek Adds 8K Series 200 Terminal

CAMBRIDGE, Mass. – Computek, Inc. has added another version to its Series 200 intelligent terminals which will feature floppy disks, eight-line vectored interrupts, a hardware macroinstruction facility and a new software development system.

Including the line's standard semiconductor random-access memory (RAM) expandable to 8K, 16-bit words and dual tape cassette and printer options with speeds up to 250 line/min, the Model 200/10 is said to operate on an instruction set designed to aid users in writing and debugging Computek Series 200 terminal programs.

Devised specifically for this intelligent terminal, the software development system, Midas, includes a resident assembler, source editor, debugger, tape cassette utility program, binary interchange program and a Midas read-only memory (ROM) loader, the firm said.

The floppy disk option comes as a single or dual disk system with 242K byte/disk. Disks can be shared between terminals, and the firm claims this format is IBM 3740-compatible.

The company noted other options available with 200/10 include asynchronous and synchronous communications interfaces to 9,600 bit/sec and a 300 card/min reader.

The model's processor is program-compatible with the Series 200 and operates at 650 nsec effective cycle time. Incorporating the modular features of the 200, the 200/10 also includes programmable ROM, masked ROM or RAM, intermixed memory up to 8K words, programmable keyboard and communications options, 10-bit character screen memory that can store three attribute bits plus character code, and 20 by 14 dot matrix characters.

Consisting of character generator, 200-character refresh memory, 12 in. monitor, power supply, cabinet and keyboard, the basic 200/10 is priced at $4,200 and is complete except for communication interfaces and program memory.

RAM expandable from 1K to 8K words ranges from $840 to $3,300. The firm added that memory contracts can carry a provision for two groups of 256 words of Prom for loading at an additional cost of $225 per group.

Interrupt is $260 and dual cassette is $2,950.

Available for delivery with interrupt in the fourth quarter of this year and with floppy disk in the first quarter of 1975, the 200/10 can be obtained from the company at 143 Albany St., 02139.

System Aids Japanese Tourists

OSAKA, Japan – A real-time terminal-oriented reservations network, based on a Univac 1110 computer system, has been inaugurated by the Kinki Nippon Tourist Co. Ltd. to speed up bookings for hotel rooms, tour packages and airplane seats.

Installed at the company's head offices in Osaka, the 1110 system is connected to six minicomputers in major cities throughout Japan. The minicomputers facilitate on-line connections to the central computer for 151 teletypewriters and 108 other terminals installed in 172 sales offices and 18 transportation centers.

Kinki Nippon calls its new network System III. In 1967 the company started with the System I network utilizing Univac 418 computer systems for hotel reservations. This network was later improved to become System II.

System III is tied into computers operated by Japan Air Lines, all Nippon Airlines and Toha Domestic Airlines. A further expansion of System III is planned by connecting teletypewriters in hotels directly with the Univac 1110.

1,920-Character CRT Enhances BR System 90

TRUMBULL, Conn. – A 1,920-character CRT terminal developed by Bunker Ramo is an enhancement to the firm's Bank Control System 90.

Full editing and formatting functions under program control of the System 90 programmable control unit, coupled with emulation software and binary synchronous communication protocol routines, make the terminal compatible with the IBM 3270, according to the firm. The company added that the 1,920-character CRT may also be enhanced to function in an SDLC communications environment.

Administrative Terminal

Available in either a typewriter or block style keyboard, the CRT is designed primarily as an administrative terminal in the commercial banking branch office by supervisory and other personnel for interrogation of the bank's customer information file.

Initial deliveries of the System 90, including the 1,920-character terminal, are scheduled for the second quarter of 1975.

Priced at $1,865, the terminal is available from the firm at 35 Nutmeg Drive, 06609.

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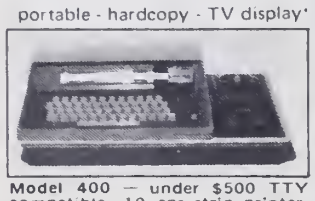

Model 400 — under $500 TTY compatible, 10 cps strip printer.
Model 800 — Similar to model 400 but includes 16 lines, 30 cps, TV display capability.
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4692 Eagle Rock Blvd.
Los Angeles, Calif.

TEC Upgrades Conversational CRT To Include 1,920-Character Screen

TUCSON, Ariz. – TEC, Inc. has an upgraded version of its buffered conversational CRT. The display is called the Model 2400 and includes a 1,920-character screen, formatted 80 char./line by 24 lines.

The 2400 has a serial asynchronous RS-232C interface, utilizes Ascii code, reads upper- and lower-case codes and displays uppercase characters. It is priced at $1,650.

Features in the basic unit include blink, tab and protect format capabilities with protected areas displayed at reduced intensity. Five cursor control keys assist operator data entry, and load and read cursor address features are provided, the company said.

A switch-selectable roll-up feature operates without delays up to 9,600 bit/sec. Data transfer rates are externally selectable in standard steps from 110- to 9,600 bit/sec.

Four extra cost options are available: split transmission rate which allows data transmission at one speed and data input at another speed, $65; rack mount chassis, $70; 16-key numeric pad on keyboard, $110; internally mounted (at factory or in field) parallel or serial hard-copy adapter, $150 to $240.

TEC is at 9800 N. Oracle Road, 85704.

TEC Model 2400 Buffered CRT

IBM 2740-Type Terminal Has 32K Microprocessor

SANTA CLARA, Calif. – Data Measurements Corp. a subsidiary of Cetec Corp., has announced an interactive terminal system within the DMC Series 400 line of programmable terminals.

The DMC 442 is compatible with IBM 2740 II communications protocol and includes a programmable microprocessor with up to 32K of memory and a 30 char./sec impact printer. The recently announced IBM 3767 is to include many of the features of the DMC 442, the company said.

Standard features include a 440-character buffer, VRC and LRC checking, buffer receive, editing feature and up to 2,400 bit/sec asynchronous or synchronous transmission speeds. The DMC 442 incorporates the Diablo Hytype I 30 char./sec impact printer with selectable 10- or 12-char./in. spacing, electronic keyboard and interface for optional 10-key numeric pad.

The programmable microprocessor with 4K memory standard, expandable to 32K, utilizes programmable read-only memories, read-only memories and random-access memories. The terminal system can be expanded to include a CRT and optionally a tape cassette, floppy disk, paper tape or card reader, the firm said.

Purchase price is $5,750. Three- and five-year lease plans are also available. Availability is 90 days from 2115 De La Cruz Blvd., 95050.

Four Years Later, Reservec Goes 'Up'

Special to Computerworld

TORONTO – Some four years and 320 man-years of effort have gone into planning and implementing Air Canada's Reservec II computerized reservation system. Included in that effort was the establishment of system requirements, selection of equipment and the actual changeover to automated reservations.

The core of the airline's system consists of three Univac 1108 computers. The system went operational with two 1108s in 1970 and a third computer was added in early 1973.

Reservation personnel handle up to 90,000 transaction requests an hour.

At present the system is linked to terminals in 46 cities in Canada, the U.S. and in Europe, and the airline is studying the feasibility of extending the system to other points in Europe and to the inner and outer Caribbean.

The Toronto-based system contains a duplicate information storage base as backup.

In addition, with the Air Canada Cargo Enquiry and Service System (Access), cargo agents can now locate goods through CRT terminals in Toronto and Montreal by punching a shipment's waybill number into the computer. The program is being extended across the airline's system and soon agents will be able to determine the stage of handling of company cargo shipments anywhere in the world.

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As an intelligent communications terminal, the new "Silent 700" model is ideally suited for such applications as catalog order entry, remote batch processing, inventory data collection and reporting, and virtually all kinds of branch office data preparation.

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The new "Silent 700" Programmable Data Terminal has a low, quantity-one purchase price of $4925. Economical monthly lease rates range from $175 to $205, including maintenance.

For more information, contact your nearest TI office listed below or Texas Instruments Incorporated, P. O. Box 1444, Houston, Texas, 77001, (713) 494-5115, ext. 2126.

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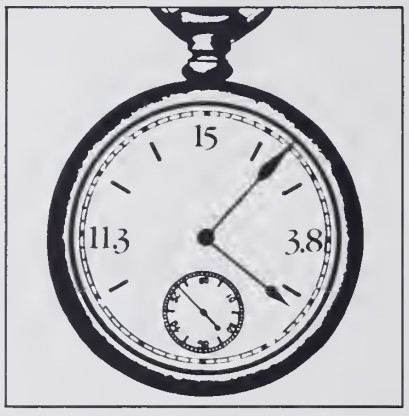

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Dial-Up Facility Reduces Errors For Trucker's Freight Data Net

OAKLAND, Calif. – System 99, a California-based trucking firm, services more points and communities in California than any other single carrier, according to Tilton Gore, director of information services.

And in order to provide effective customer service, System 99 is using communications equipment to capture, transmit and process freight delivery receipts and administrative information.

Prior to the installation of the Wiltek equipment, System 99 was using a leased-line, 10 char./sec network. This was an asynchronous communications system which was a combination of manual and automatic transmission techniques.

Out of 15 locations, only 10 sites were large enough to justify KSR (keyboard, send-receive) devices. Five locations had to rely on the mail or have their freight billing operation performed by another location equipped with KSR equipment. The daily volume of this network was almost 900,000 characters of freight bill information, Gore said.

While it was imperative that this data be accurately transmitted, there was no error-checking capability within the network, he continued. Consequently, there was a great deal of retransmission of messages.

The system had countless drawbacks, he said, including:

- Slow transmission speed. The network could handle only 65% of the traffic volume. There was no possibility of accommodating any growth in volume.
- The leased line costs were prohibitive.
- There were line contention problems.
- The system demanded constant attention and manual coordination.

These drawbacks left System 99 no choice but to upgrade its data communications system. The updated system requirements included:

- The use of dial-up facilities rather than leased lines.
- High-speed, automatic transmission.
- Buffered operation and batch transmission.
- The capability of handling a growing traffic volume.
- Simple-to-operate terminal.

Several manufacturers of data communications equipment were considered, but after thorough evaluation, Wiltek was chosen as the vendor who could best satisfy system requirements, Gore said. "The concept of buffering is exactly what we were looking for."

At the present time, System 99 is utilizing Model 400 data communications terminals. This hardware completely eliminates manual transmission and the leased lines.

These Wiltek units transmit data at 1,200 bit/sec over voice-grade Wats lines. They have two endless-loop magnetic tape buffers, one to send traffic and one to receive traffic.

Each buffer has a 50,000-character storage capacity. Along with the two buffers, the terminals contain a communications control unit and an internal modem, Gore noted.

Although there are 24 locations, System 99 utilizes 41 terminals. These include auxiliary units used at high-volume locations. This is possible because the communications control unit can interface up to eight auxiliary buffers, he explained. The auxiliary buffers utilize not only the communications control unit but also the modem and data access arrangement (DAA) of the master terminals.

The Wiltek terminals are controlled via an Action Communication Systems, Inc. message switch which accesses the units through three Wats bands. This message switch is interfaced through magnetic tape to the central processing unit. In this way, master files are accessed and updated daily without keypunching.

Using the terminal network, System 99 transmits administrative messages and freight bills. The daily traffic of freight bills alone is 1.3 million characters and this volume is expected to grow to over two million characters, Gore said.

The raw data for the freight bills is a bill of lading from the customer. This information is sent to the central billing locations. There are six billing locations. At the billing locations, charges are figured and a freight bill is created.

Central billing office at System 99 trucking firm includes Wiltek terminals and Action Communications Systems message switch.

The freight bills first are prepared on the Model 400 units. All the information typed on the bills is transferred to the terminal's send buffer for storage until the message switch calls the terminal to initiate data transmission.

At the time of transmission, freight bill data is logged on tape in the message switch while being forwarded to the destination location. The message switch tape is transferred daily to the CPU so that the master files can be continually updated.

At the destination location, the formatted freight bills are automatically printed out at 30 char./sec, ready to be signed upon delivery of the shipment.

Using the system, the night billing operation can be completed by 3 a.m. This represents a time saving of four-and-one-half hours over the old system. Among the major objectives Gore feels the communications network has achieved are:

- Bisynchronous communications which reduces transmission error rates.
- Easy information retrieval and retransmission capabilities due to the terminal buffers.
- The ability to capture all the information on magnetic tape and input to the CPU without keypunch.
- Fast information turnaround. Invoices are prepared two days sooner.

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Bits & Pieces

Gould Interfaces Plotters To Three Univac 1100 CPUs

NEWTON, Mass. – Gould, Inc. is offering a controller called Univac 110X to interface its 4820 and 5000 series electrostatic printer/plotters with Univac 1107, 1108 and 1110 computers.

With the controller, the Gould printer/plotters can print alphanumeric data at the rate of 3,000 line/min and plot graphic material up to 75 sq in./sec, according to Gould.

The standard 110X controller requires one Univac channel and can handle as many as 14 Gould units.

Input/output protocol uses Univac's arbitrary device handler, and software is provided through Gould's hardware print and plot package.

The 110X is priced at $6,900, with delivery in 60 days from 20 Ossipee Road, 02164.

Carriers Hold S/3 Cards

LOS ANGELES – Beemak Plastics is offering punch card carriers designed to protect IBM System/3 cards that travel with materials through a manufacturing process.

The rigid polyethylene card-holders are designed to hold up to 15 cards.

In quantities of 1,000, the price is 20 cents per carrier, with larger quantity discounts available.

The company is at 7424 Santa Monica Blvd., 90046.

Bar-Coded Labels Verified

DAYTON, Ohio – The printing accuracy of bar-coded tags and labels can be verified with the Model 2352 verifier from Monarch Marking Systems, Inc.

As the operator passes the tip of the light pen across the bars of code, the scanner reads the encoded information and displays it in readable form. When large quantities of bar-coded tags and labels are imprinted, spot checks can be made using the verifier, the firm suggested.

The price of the Model 2352 verifier is $1,770. The firm can be reached through P.O. Box 608, 45401.

CMI Ups Lease, Purchase Prices For 370/Stor Memory Systems

BEDFORD, Mass. – Cambridge Memories, Inc. will increase lease and purchase prices on its line of 370/Stor computer memory systems from 6% to 8% effective Nov. 1.

Lease prices on the 370/Stor 145 system will be increased an average of 8%. Lease prices on 370/Stor 155 and 165 systems will be increased 6%.

Purchase prices for all three systems will be increased 6% and maintenance rates will be increased 8%, the company said.

HP Packs 192K on 21MX Minicomputer

By Vic Farmer
Of the CW Staff

PALO ALTO, Calif. – Using a dynamic mapping memory management scheme and 4K random-access memory (RAM), Hewlett-Packard has packed 192K of semiconductor memory into a 17-1/2 in. high 21MX minicomputer system without sacrificing cycle time, according to HP.

The HP Dymanic Mapping System (DMS) functions with main memory somewhat as "virtual memory" schemes function with disk memory, HP said. DMS allocates main memory dynamically under supervisory program control.

The scheme expands the address space from 15 bits to 20 bits and can therefore manage a 1M-word memory. The most significant five bits of the standard 15-bit address bus are used to select one of 32 high-speed registers in the DMS hardware.

Each register points to one of a possible 1K pages (each of 1K 16-bit words) and also provides two bits of read/write information for that page, HP said.

There are four independent and dynamically alterable 32-register blocks, the "maps" of DMS. Two maps configure memory for program execution (one for the system and one for the user) and two are assigned to the Dual Channel Port Controller for direct memory access operations.

By structuring the processor with separate buses for data and addressing, and using high-speed microcoded routines, the translation done by the DMS is completely transparent to the memory cycle, which preserves a 650 nsec cycle time, HP said.

The DMS firmware includes 25 new microcoded instructions, including cross map moves and block transfers, to give extensive control over memory allocations and read/write protections, HP claimed.

The user can add his own unique memory management and protection instructions to optimize his particular system design, the company added.

In addition, the 25 instructions give read/write protection on an individual 1K page basis and can be field installed.

Although the 21MX minicomputers were previously limited to users purchasing five or more [CW, May 1], HP has eliminated this restriction because there are now adequate supplies of the 4K RAM chip, the company said.

The 21MX Series offers microprogrammability, parity, floating point, extended arithmetic unit and a "brownout-proof" power supply.

The smallest processor mainframe, the 5-1/4-in. high M/10 (previously called the 2105) with 16K words of memory, is priced at $7,400. The M/20 (previously called the 2108), with 32K words and a microprogrammable processor, is priced at $14,000.

HP said no further controllers are needed to increase memory size. The 12990A Memory Extender Chassis (MEC), has a capacity for eight 16K-word memory boards.

The maximum size 21MX presently available consists of this MEC and a 64K-word M/20 processor for a total of 192K words. It has a list price of $66,600. But HP has also hinted that units with a 1M-word memory can be purchased.

HP is at 1501 Page Mill Road, 94304.

Vendor Aid, Flame-Proof Vault Get Bank Going 2 Days After Fire

MICHIGAN CITY, Ind. – Quick service from its vendor and good protection for its tapes enabled the Citizens Bank here to recover from a major fire earlier this year in just two days.

The fire began on a Wednesday during banking hours, destroying over 6,500 square feet of the bank. Flames spread to the computer, commercial loan and storage departments, files and the proof department which is operationally termed the "core" of the bank.

Included was equipment housing the magnetic tapes which contain master records of checking and savings account deposit balances and other transaction records.

"It was the following morning before the fire was extinguished," reported Robert Cleveland, vice-president and cashier. "Anyone looking at the bank at that time would have been justified in estimating that it would be weeks before we could even determine the loss. Our IBM 360/20 computer was completely destroyed, and the valut housing our tapes was in the debris of one of the rooms that had been swept by fire."

Yet the Citizens Bank was processing its tapes on a new computer system by Friday, just two days after the event.

Cleveland attributed the rapid recovery to two factors. For one thing, IBM, by drawing upon equipment from various parts of the country, was able to replace the 360/20 within 48 hours, installing and testing the system at a temporary location near the bank.

For another, the tapes emerged unscathed from the fire. They had been housed in a Wright Line Data-Bank safe which was designed and constructed specifically to protect magnetic media.

"The recovery of these records in immediately usable form was important not only to the regular day-to-day deposit accounting, but also to our standing as a reliable source of processing for many firms and organizations in the community," Cleveland said. "The inventory and payrolls of local companies, the United Fund records, the label printing – all were operational by Friday."

Remote Keyboard Runs PDP-8/E

SAN LEANDRO, Calif. – A small calculator-type keyboard with a seven-segment LED octal display performs remotely all of the standard functions of Digital Equipment Corp.'s PDP-8/E programmer's console, according to the manufacturer, Douglas Electronics, Inc.

Current memory address and selected register contents can be continuously displayed on the RFP-80. Choice of display, data entry and various instructions are accomplished by push-key operation. The display and keyboard operate in octal, the company said.

The package includes the bus plug-in interface circuit board, 10-foot interconnecting cable and a plexiglass front panel replacement for the PDP-8/E front panel with a cut-out for the power switch. A PDP-8/E instruction set is printed on the bottom of the 3 in. by 6-in. by 1-1/2 in. hand unit.

Any number of remote RFP-80s can be connected to a central minicomputer, the company said. Extra long cables to link these remote stations are available on special order.

The RFP-80 package price is $700 from the firm at 718 Marina Blvd., 94577.

RFP-80 Remote PDP-8/E Panel

For DEC's PDP-11/45

Buffer Has 450 Nsec MOS Speed

MINNEAPOLIS – Fabri-Tek, Inc. has introduced a high-speed memory enhancement, the Model 4511 memory buffer, for Digital Equipment Corp.'s PDP-11/45.

The 4511, which uses semiconductor technology, is said to buffer the 11/45's entire 128K words of main core memory, achieving an effective MOS speed of 450 nsec.

Although the performance improvement has been described as program-dependent, the company noted with proper programming the 4511 should double CPU efficiency.

The plug-compatible Model 4511 design, which uses bipolar technology, has 512 words by 16 bits of available storage.

The machine is available up to 128K and may be operated with any core memory system attached to the Unibus of the PDP 11/45 computer.

With 8K words of core, the model 4511 sells for $11,810. The company is at 5901 S. Country Road 18, 55436.

Pertec Tape Transport IBM-, Ansi-Compatible

CHATSWORTH, Calif. – A 10-1/2 in. reel vacuum column tape transport from Pertec Corp. is IBM- and Ansi-compatible.

The transport is available with tape speeds from 25- to 75 in./sec and data transfer rates up to 120 kchar./sec.

Pertec said the transport has an anti-twitch reel servo to minimize tape wear.

Standard configurations for the tape drive include 7- or 9-track NRZI, 1,600 char./in. phase-encoded (PE) or an optional electronically switched dual-format NRZI/PE.

An edit feature allows selective updating of prerecorded tapes.

Single unit price is $4,715 from Pertec at 9600 Irondale Ave., 91311.

Paper Tape Readers Work With IMP Micros

CANOGA PARK, Calif. – Icom, Inc. has developed a paper tape reader, the R8016P, for direct interface with National Semiconductor microcomputer models IMP-8P and IMP-16P.

Said to be eight times faster than a standard teletypewriter, the unit has plug compatibility with a micro's card reader interface, compatible software and a photoelectric character detector.

Assembler program loading is less than 2 minutes, the firm said. Software for the R8016P reader is supplied on paper tape which is loaded into customer-supplied programmable read only memory (Prom) with optional loaded Proms available.

The unit is priced at $995 from the firm at 6741 Variel Ave., 91303.

Disk Cartridge Controller Plugs Into PDP-8's Omnibus

BERKELEY, Calif. – Data Systems Design's 240 disk cartridge system, for Digital Equipment Corp.'s PDP-8 and PDP-11s has a controller that plugs directly into the PDP-8 Omnibus or mounts inside a PDP-11 as a system unit.

The system provides access to up to eight disks, with 400M bits of data storage.

The company also said any format and preamble may be read or written under program control, and a single instruction permits the user to transfer large files in block format without maintaining intermediate word counts or addresses.

Price for the PDP-8 model is $3,600, and for the 11, $3,900. The firm is at 1122 University Ave., 94902.

TI Puts Service On-Line

HOUSTON – Texas Instruments (TI) has gone on-line with Ti-Care, a remote computer diagnostic and dispatching service for customers with TI computer equipment and systems.

The service provides a single point of contact for customers with multilocation installations, according to the company.

Using direct distance dial phone lines its enables computerized dispatching and real-time tracking of service calls. Each call is logged into the computer with status reports generated at specified intervals until the call is completed.

To date, the company reported, approximately 30% of the calls are cleared without dispatching a customer service engineer.

Books and Brochures

Report Analyzes Tradeoffs of Implementing Mini System

Issues Involved in Implementing a Data Processing System on a Minicomputer, by Ronald Barry Freeman, Document No. AD-782 250/5WC, National Technical Information Service, 5285 Port Royal Rd., Springfield, Va. 22161. 229 pages, $6.00; microfiche, $1.45.

This report analyzes various tradeoffs and questions and offers possible compromises and solutions for software, hardware and the human factors considerations.

Author Ronald Freeman, of the Wharton School of Finance and Commerce at the University of Pennsylvania, has included an instruction manual for a data processing system he designed for the U.S. Navy.

This particular system, which automates the logistics control and report-generating functions of the supply department for many Navy ships, exemplifies the use of minicomputers in DP systems.

Mini as Engineer Evaluated

Minicomputer (Tecmat), by John P. Francis, Document No. AD-782 943/5WC, National Technical Information Service, 5285 Port Royal Road, Springfield, Va. 22161. 61 pages, $6.25; microfiche, $1.45.

This is an engineering evaluation of the effectiveness of a minicomputer system in management and engineering problems.

The minicomputer is a small off-the-shelf digital computer. The central processor is a Data General Nova Model 1210 with 16K core memory and an additional Linc model 600 magnetic mass memory.

The data terminal is a Texas Instrument Silent 700 keyboard printer with a writing rate of 30 char./sec. Also included is a Remex high-speed paper tape reader.

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Reduces Inventory

User's Small System 'Paints' Best Production Picture

UPLAND, Calif. – The production controller at Pactra Industries here doesn't have to spend a lot of time figuring out the best production sequence for his company's products. The firm's small business computer does the job for him.

The task is particularly important at Pactra, a small paints and hobby supplies manufacturer, since the order in which paints are produced can have a big effect on clean-up time, noted Wes Leonard, who is both plant production and DP manager.

Pactra employs about 100 people, occupies a 70,000 sq-ft plant and generates $7.5 million in annual sales from a product line of about 1,500 items.

Pactra's computerized inventory and production control system starts with operators at three CRTs who key data from sales invoices into a Basic/Four Model 400 CPU.

The configuration includes a 4.2M byte high-density disk drive and a Model 350 medium-speed matrix head printer.

Reduces Inventory

The system uses this data to reduce the inventory of finished goods and to print out a general stock status report twice weekly.

To complement this, the system prints out a more timely exception report noting which goods are particularly low because of newly-entered orders.

The inventory control manager than evaluates the reports and orders production runs. The computer can print out the number of units needed to get stocks back up to the desired level, the amount and kind of raw materials needed and the unit cost of a product.

These documents go on to the firm's purchasing agent.

Before the actual production run, the controller can randomly key in production orders for any one size of spray paint can.

The computer then sorts the product by propellant, type of valve and paint sequence and comes up with a document listing the most efficient way to run all the orders the controller has keyed in.

However, if the firm has back orders or other exceptions, the controller bypasses this list, Leonard noted.

This document, which goes on to the machine operator at the filling machines, also indicates when a valve is to be changed and what ingredients are to be used to cut down on costly oversights, Leonard said.

The production staff returns a document daily on what they have produced, what materials they have used and other data. This is keyed into the system and updates the finished good master file and the raw material file, Leonard said.

Leonard, who did the programming for the system himself, said Pactra acquired the computer in 1972 because its unit record equipment was hard put to keep up with the company's growing workload.

That system's results were neither "as timely or as sophisticated as what we're doing now," he added.

Since acquiring the system, Pactra has added a third display. With two displays the system had cost $1,000/mo on a lease/purchase plan, Leonard said.

This was virtually the same as the unit record system's cost, he added.

Why Crime Pays Less Than Ever
In Lake County, Illinois:

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In an inflationary economy, it's nice to see someone holding the line on the wages of sin.

That's what they're doing at the Lake County Sheriff's Office. With a little help from INCOTERM.

A powerful INCOTERM SPD®10/20 Intelligent Display terminal serves as controller for 50-odd mobile teleprinters in local and county police cars covering nearly 500 square miles of northern Illinois.

The officers on the road call in verbal reports and queries; they get hard-copy responses right in the cruisers. For the first time, police can receive such transmissions with no risk of unauthorized interception.

At the other end, INCOTERM ties into the Illinois LEADS system in Springfield, to access the state's fast-growing criminal data bank...about crimes, about vehicles, about stolen property, about guns.

Through INCOTERM, the officer on the street can also communicate with law enforcement agencies in surrounding states—Wisconsin, Ohio, Indiana, Kentucky—over the high-speed lines of the new ALECS system. And INCOTERM also ties him into the NCIC system of the FBI.

Even if a suspect is seated in the cruiser beside the officer when the return message comes in, INCOTERM screens the information in the station house first to permit the encoding of data critical to the officer's safety.

And it does all this while cutting typical transmission times in half. Plus...the built-in INCOTERM memory lets the officer in the car interrupt incoming messages for emergency voice transmission—without missing a word.

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Post Office a Long Way From the Pony Express

WASHINGTON, D.C. – An RCA-developed automated system is facilitating U.S. Postal Service window operations in a pilot program at three San Jose, Calif., locations.

The data management system, designated by the Postal Service as Point of Sale/Transaction (Post), assists clerks in selling postal commodities such as stamps, parcel post and money orders and provides up-to-the-minute accounting information.

The system's stand-alone terminal features a microprocessor, a special function keyboard and a 5-in. CRT display. In addition, a built-in card reader and printer are employed.

When conducting a transaction for a customer, the postal clerk uses the keyboard to insert information into the system. The type of transaction, charges involved, money received and change due the customer are computed and displayed on the screen.

Two paper copies of the data, one for the customer, the other for Postal Service records, are printed. The system also records the transaction on cassette tape for later processing.

Tape Standard Proposed For Bibliographic Data

WASHINGTON, D.C. – A proposed standard for bibliographic information interchange on magnetic tape is being coordinated with federal departments and agencies, state and local governments, industry and the public by the Commerce Department's National Bureau of Standards.

This standard, which is the adoption of a voluntary industry standard developed by the American National Standards Institute, prescribes a format for the interchange of bibliographic data. It will be used for formatting and recording of records on magnetic tape used to interchange bibliographic information between a variety of data processing systems.

Federal procurements will cite the standard whenever the results of such contracts are in the form of recorded bibliographic records on magnetic tape.

Copies of the proposed standard are available from the Office of ADP Standards Management, Institute for Computer Sciences and Technology, NBS, 20234.

Tote That Card!

WYNDMOOR, Pa. – The Pennsylvania Pacific Corp. now offers plastic containers designed to accommodate 80-column punch cards.

The Model 1812, measuring 18 in. by 12 in. by 6 in., is priced at $12.95. The Model 2015, at 20-1/2 in. by 15 in. by 6 in., sells for $16.45. The company is at 805 E. Willow Grove Ave., 19118.

For Better Control of Data

Factory Users Have Wide Choice of Systems

By Robert B. Dubner
Special to Computerworld

There are a variety of computer-based systems that gather, analyze and disseminate factory data to provide management with better control information. The user must choose among these alternatives in the light of his own plant's specific needs.

The nature of the business and its size (in number of people and machines) are two of the major factors which determine the appropriate system. A production plant's requirements differ from a job shop as does a process industry's or assembly plant's differ from a discrete-part manufacturer's requirements.

In order for any manufacturing management information system to be useful, information must be current and accurate; therefore, the method of collection becomes vital to the overall system's effectiveness. Many plants have depended on a paper and pencil approach to collect this information and then process the data on an off-line, batch basis.

This approach may be adequate for plants with less than 40 work stations, but in a larger plant it becomes unwieldy and suffers the inaccuracies and delays inherent in a manual system.

There are two basic approaches for on-line collection of data for a manufacturing management information system: remote data entry terminals and a sensor-based production monitoring system.

Remote Data Entry

The first approach is the remote placement of a limited number of data entry terminals, linked to a computer, at centralized locations on the plant floor. The data entry terminals vary from CRT terminals and teletypewriters to card and badge readers with the additional capability of entering variable coded data.

The obvious benefit of this approach is that variable and complex as well as fixed data can be transmitted directly from the shop floor to the computer for further processing.

The type of computer and system utilized varies; depending on the application, from stand-alone, dedicated minicomputers that may be interconnected with host large-scale computers to a large-scale computer performing the data acquisition function on a time-shared basis.

This approach is most suitable for assembly plant or job shop applications because the information required is concerned with tracking the progress of each subassembly or part as it moves from station to station.

In a job shop environment where jobs are typically short-run, the data entry terminal becomes a direct replacement for the manual recording of job information of varied complexity.

The automatic collection of the data entered about the location and status of a job provides management with current information necessary to evaluate the actual performance against schedules and make the assignment of job priorities. The terminals may be similarly used to collect data for labor reporting.

It is important to note that, in many cases, although the data is collected automatically as the transaction takes place, the information is processed off-line on a batch basis in order to update files and provide reports on the previous day's activity.

Sensor-Based System

The second approach, a sensor-based production monitoring system, provides a means of collecting vital production information on piece count, runtime and downtime directly from the individual machine.

The system utilizes a work station terminal directly affixed to each monitored position. The terminal automatically collects production count from physical sensors tied into the monitored machine, while at the same time providing a vehicle by which both operator and foreman can keep the system aware of the operational status of their machines.

One benefit of this approach is that production count and machine/operator status information is collected coincidentally with actual job performance and without requiring the operator to leave his work area or become his own timekeeper/keypunch operator.

This real-time approach is ideal for production plants manufacturing discrete parts since management in these plants must be aware of substandard performance or problems either as they arise or in summary reports.

Hybrid Approach

It is obvious that manufacturing operations do not necessarily fit neatly into the categories described and therefore may require a system solution that is a hybrid of the two approaches.

An example would be an assembly plant which manufactures discrete parts required by the assembly departments. An ideal system in this situation would be a sensor-based production monitoring system in the feeder departments and assembly departments complemented by a limited number of remote data entry terminals.

The work station terminals could be utilized to monitor the machines and the assembly lines, keeping management abreast of their status and productivity.

Dubner is vice-president of the Information Automation Co.

Arkansas Raft Race Joins Wave of Future

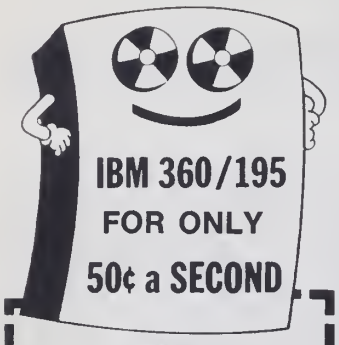
TULSA, Okla. – It will probably be called the Great Computer Raft Race after this year.

Tulsa's annual race down the Arkansas River this year had more rafts, more captains and crew and – computers.

Because of the different raft categories and difficulties in recording start and finish times, it took nearly three days to get the final race results last year.

This year the number of rafts and starting times were entered into the system and the computer kept a running track of the best elapsed times.

The results were known within an hour after the race, and the system is scheduled to be used again next year.



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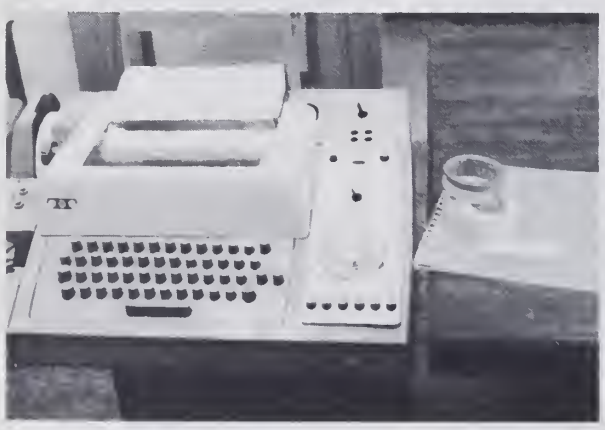

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Data Communications

Includes SDLC, HiD-LoD, and other topics that weren't even heard of a year ago.

Data Communications is a complicated and rapidly changing field. And this seminar will give you the information you need to keep on top of the subject. Led by the nationally recognized teleprocessing consultant, Dr. Dixon Doll, the course covers recent changes in areas like SDLC, HiD-LoD, DDS, newly approved major revisions to WATS, and the impact of satellite carriers and specialized carriers.

The course will also cover general data communications topics, including intelligent terminals (performance and selection criteria), network software handlers (e.g. CICS) and network organization and design. And, you'll learn about saving money using such innovative concepts as split-stream modems, remote-multiplexers/concentrators, diagnostics for fault isolation and front-end processors.

All participants in this seminar will receive a 2-volume loose-leaf outline of all course materials (prepared by ICC Institute), a copy of "Data Modems Selection and Evaluation Guide" by Vess V. Vilips and a "Data Communications and Teleprocessing Dictionary".

You should attend this seminar if you are currently involved in data communications on a management or operational level and wish to expand your knowledge of the field – or if your company will be going into this area in the near future.

This seminar runs two days, and total cost, including workbook, reference materials, luncheons and continental breakfasts is $350. Additional registrants from the same company qualify for a reduced rate of $300. Current schedule is as follows:

Chicago	Hyatt Regency O'Hare	November 4-5
Miami	Miami Marriott	December 2-3

Data Base Management

A practical approach to the design and implementation of data base systems.

The difference between an effective data base system and a waste of computer time and memory lies in effective planning, system selection and management. And this course gives you both the information and the basic experience you need for the proper design and implementation of a data base system.

Given in association with Leo J. Cohen and Performance Development Corporation, this course covers a comprehensive list of topics, including:

- *the description and definition of the Data Base System Project.*
- *the development of a full-service analysis and system design.*
- *optimum file organization and indexing techniques.*
- *all available indexing techniques and their implementation.*
- *all aspects of system management.*
- *and much more.*

One of the key features of this course is the workshops, in which you'll apply what you've learned. And before you're finished you'll have "done" a complete, on-line order entry/inventory management system.

You should attend this seminar if you are (or will be) involved in the design and implementation of a data base system – whether as a DP Manager, Data Base Administrator, Planner, Analyst or Programmer.

This course runs for 3 days, and costs $350, including course materials, continental breakfasts and luncheons. Additional registrants from the same company qualify for a reduced rate of $300. Current schedule:

Chicago	Playboy Towers	November 18-20
Denver	Denver Hilton	December 9-11

Contracting for Computers and EDP Support Services

A seminar that can help you protect your EDP investment – and your system.

In an industry that's famous for its "promise them anything" attitude, you need good, effective contracts from the vendors that supply your installation. And this seminar gives you the information you need to get them. It will show you how to protect your installation from late deliveries, inadequate equipment or services and the costly disruptions that they can cause.

Course topics include the lease and purchase of computer systems, separate hardware and software – the purchase of time sharing, data processing services and consultation – and the use of facilities management.

Under the personal instruction of Roy N. Freed, a nationally known lawyer, author and expert in the field of computer law, you'll learn how to place yourself in a strong bargaining position, how to insure on-time delivery of exactly what you want, how to set reasonable performance standards for warranties – and much more. You'll also receive a complete resource notebook, *including sample vendor contract forms.*

You should attend this seminar if you are involved in the purchase of EDP equipment or services, whether as a corporate counsel, contract administrator, DP manager, consultant or officer of a using firm.

Cost for the entire 2½ day seminar, including complete resource notebook, continental breakfasts, luncheons and coffee breaks is $295.00. The current schedule:

New York	St. Moritz	October 23-25
Chicago	Hyatt Regency O'Hare	December 4-6

How to Draft Effective Legal Agreements Relating to Computer Technology

A one-day workshop for non-legal technical people

For a variety of reasons, computer users and computer manufacturers often use non-legal people to draft agreements. These agreements are used for specific transactions and as "standard forms", and they can cause significant problems. It's easy to overlook important legal points – especially if you're not a lawyer – and this workshop is designed to give you the basic knowledge you need to avoid the pitfalls.

Conducted by Roy N. Freed, course leader of our comprehensive contracting seminar, the workshop includes the following topics: Purpose and functions of formal agreements; architecture of agreements; language caveats; use of forms; checklists and outlines; suggested writing style; sources of applicable legal rules; sources of assistance; and more.

Cost of the workshop, including resource notebook and lunch is $135. Current schedule:

Boston	Sheraton Boston	November 20th

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Key-To-Disk Systems

How to evaluate and optimize the most common successor to keypunch equipment.

Data entry is a big problem – and a big headache – as every computer user knows. And key-to-disk systems are one of the most popular methods of improving efficiency in this area. So this course is designed to help you in the practical aspects of selecting, installing and making the best use of key-to-disk. Topics include:

- *key-to-disk hardware and software.*
- *starting a key-to-disk system.*
- *data entry system design.*
- *key-to-disk as a remote batch terminal.*
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COMPUTER INDUSTRY

CI Notes

STC to Supply CII, Siemens

LOUISVILLE, Colo. – Storage Technology Corp. has signed a purchase order agreement with Siemens Corp. and Compagnie Internationale Pour L'Informatique for about $14 million worth of tape systems. Volume shipments of the models 3630, 3640, 3650 and 3670 tape drives, as well as the 3800 model 4 control unit, will begin in 1976.

IBM Office Monopoly Charged

NEW YORK – In addition to facing several antitrust suits in the computer area, IBM now has on its hands a complaint filed by Eaton Allen Corp., maker of typewriter ribbons, charging it with monopoly in the office supply industry.

The complaint, filed in U.S. District Court here, charged that IBM's manufacture of correction material has deprived Eaton of its $40 million share of a $100 million market in this area. Eaton is asking for treble damages and an end to IBM's alleged monopoly in the field.

Univac 90/30 Hits 100

BLUE BELL, Pa. – Worldwide sales for the Univac 90/30 computer system have passed the 100 mark in the three months since its introduction, according to Frank B. Holst, Univac's director of program management.

About half of the orders were received from the U.S. and the bulk of the remainder from European countries and Japan, he said.

Supershorts

Optical Scanning Corp. will market and service Infoton, Inc.'s line of CRT terminals for the end-user market. Infoton will continue to sell to the OEM market.

– – –

Printer maker Qume Corp. has named C. Itoh and Co., Ltd. as its Far East distributor and has assigned manufacturing rights to the firm.

– – –

Decision Data Computer Corp. has appointed Compania Nacional de Computacion, S.A. as its distributor in Venezuela.

– – –

Xebec Systems Inc.'s Alphabec 70 pen that allows direct entry of hand-printed data has been named one of the 100 most significant technical products of the year by Industrial Research, Inc. The pen was developed at Stanford Research Institute.

Clarification

Lear Siegler's Electronic Instrumentation Division is negotiating a standard OEM contract to supply Victor Associates with ADM-1 and ADM-2 terminals [CW, Oct. 2].

Commerce Reports

Japan DP Imports to Hit $1 Billion by '77

By a CW Staff Writer

WASHINGTON, D.C. – Japan's imports of DP equipment will grow at an annual rate of 30% through 1977, when they should exceed $1 billion, according to the Department of Commerce.

The U.S. share of the rapidly growing market should remain constant at about 55% through this period, although that is down from the 70% high attained in 1971, when all DP imports totaled $274 million.

In 1974, Japanese DP imports should reach $566 million, Commerce's *Export Market Digest* said.

The total Japanese market is expected to average an annual growth rate of 43% through 1977, when annual sales should exceed $10.7 billion from the 1972 base of $1.8 billion.

Japanese production of computers and related equipment has doubled every two years since 1964 and totaled about $1.5 billion in 1972, according to the report.

Local production supplied 83% of the total market in 1972, but import liberalization policies should increase the country's level of imports, Commerce noted.

Minis Blazing

One of the fastest growing segments of the Japanese market is the minicomputer area, which is expected to blaze a 60% average annual growth rate through 1977, when sales of both domestic and imported machines should top $630 million.

The market for small, medium and large systems, which nearly doubled between 1970 and 1972 when it stood at $934 million, should attain an annual growth rate of 39%, resulting in sales of over $4.8 billion in 1977.

Total imports of digital computers jumped from 4,522 units with a value of $63.1 million in 1970 to a projected 13,826 units in 1973 with a value of $105.6 million.

The U.S. share totaled 3,033 units or $53.3 million in 1970 and 2,537 units or $68.2 million in 1973.

Independent peripheral sales in Japan are expected to rise at a 44% annual rate, reaching $4.3 billion by 1977, according to the report. In 1974, the independent market is estimated to reach $1.4 billion.

Imports of peripheral equipment, memory and I/O devices totaled 35,797 units for a value of $116.7 million in 1970 and 95,052 units or $164.4 million in 1973.

The U.S. contributed 26,341 units with a value of $80 million in 1970, while in 1973 shipments were 52,596 units with a value of $98.2 million.

Use of on-line peripheral equipment is expected to more than triple by the end of fiscal 1976 to 152,000 units compared with the 44,110 units in use at the end of fiscal 1972, according to the Japan Electronic Industry Development Association.

The market for U.S.-made communications terminals should expand since these are considered technologically superior to those made in Japan, the report noted.

Other Markets

Other peripherals for which there are "highly favorable sales prospects" are high-speed printers, magnetic tape systems, CRT inquiry response terminals, document readers, disk drives, plotters and converters.

Marketing opportunities for key-to-tape/disk terminals are "outstanding," particularly for those with a 128-character Katakana set, the report said.

Another emerging area is that of read-only memory devices.

The market for data transmission equipment is projected to grow to more than nine times its present level by 1977, reaching $868 million.

Fixed-program and stored-program preprocessors as well as concentrators also should find good market acceptance, the report said.

IBM 3d-Period Earnings Up 16%, While Burroughs Records 22% Hike

Third-quarter reports at IBM and Burroughs Corp. continued the record setting patterns established earlier, although IBM's third-period income gain of 16% was off the 31% pace set in the first half. Revenues rose more than 13%.

IBM Chairman Frank T. Cary cited a decline in the proportion of outright sales on DP equipment compared with the first and second quarters. He warned that the margin of growth for the rest of 1974 will likely be slower than in the first half because of the strong 1973 fourth quarter.

Burroughs reported a blazing 27% rise in nine-month operating earnings with revenues up 18% compared with the same 1973 period.

At IBM, third-quarter earnings rose to $477.3 million or $3.23 a share from $409.9 million or $2.81 a share a year ago.

Revenues reached a record $3.13 billion from $2.76 billion in the same 1973 quarter.

Nine Months

For the nine months, IBM earnings jumped almost 26% to $1.39 billion or $9.45 a share from $1.11 billion or $7.59 a share. Revenues rose 21% to $9.39 billion from $7.75 billion in the year-ago period.

In the first quarter, IBM earnings rose 27% and revenues almost 23% compared with year-ago figures, while in the second quarter earnings soared 35% with revenues up 28%.

The third-quarter increase in revenue from rentals and services alone was 9.5%, which trails the 10.2% gain realized in the first half.

"During the third quarter, outright purchases were lower than in the first and second quarters of 1974," Cary admitted.

"We have previously reported that in view of the very high level of outright purchases in the last half of 1973, the comparative rates of increase in gross income and net earnings reported during the first and second quarters of 1974 probably wouldn't continue," he said.

"In view of the record level of purchases achieved in the fourth quarter of 1973, this decline in comparative rates of increase is expected to continue for the balance of the year," he continued.

"Despite softening economic conditions and high inflation rates around the world, shipments and installations of new DP equipment continued at a high level during the third quarter," Cary said.

Revenues Top $1 Billion

At Burroughs, revenues for the nine months totaled $1.05 billion compared with $891.7 million during the same 1973 period.

Earnings rose to $81.1 million or $2.08 a share compared with $66.2 million or $1.72 a share in the year-ago period, when there was a $2.5 million special credit from the sale of securities.

The rate of rise in third-quarter Burroughs earnings again outpaced revenues, 22% to 14% compared with the year-ago figures.

Earnings reached $25.8 million or 66 cents a share compared with $21.2 million or 55 cents a share in the year-ago third period.

Revenues rose to $346.7 million from nearly $303 million in the year-ago period.

Total worldwide orders for the nine-month period increased 21% over the same period last year, while worldwide backlogs rose 34% since the beginning of the year, noted Chairman Ray W. Macdonald.

Equipment orders in the third quarter continued strong, increasing 18% over last year's quarter, he said.

The business minicomputer market, which he said is often viewed as an economic indicator, also continued strong in the third quarter, increasing 17%.

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Contracts

Systems & Computer Technology Corp. has signed a four-year facilities management contract with Delaware Community College, Media, Pa. The firm will also develop an integrated administrative system from its Library of College and University Systems.

Systems Architects, Inc. has received a contract from the Library of Congress for design of an automated library information storage and retrieval system that will support a nationwide network of regional libraries providing services to handicapped readers.

Financial Industry Systems has been selected to provide facilities management services to The Covenant Group of insurance companies.

Boeing Computer Services, Inc. has been awarded a contract to service the DP and data communications requirements of the newly formed Jersey Data Network.

Larse Corp. has received a contract from Honeywell, Inc. to provide digital multiplex communication equipment for a traffic control system in Greensboro, N.C.

Dest Data Corp. has been awarded a contract from Dow Jones and Co., Inc. to develop, manufacture and market a flatbed laser scanner and recorder for scanning newspaper proofs, converting them to digital signals and, at another site, exposing the information onto offset plates.

Tennecomp Systems has received a contract from the Tennessee Valley Authority for design and manufacture of four Digital Equipment Corp. PDP-11 computer-based monitoring systems.

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TRW to Manufacture, Market POS System

By Molly Upton
Of the CW Staff

LOS ANGELES – The point of sale (POS) arena has another gladiator. TRW, Inc. has signed a letter of intent with May Department Stores under which it will manufacture and market a POS system developed by May in conjunction with Systems Science and Software (S-Cubed).

The system includes credit authorization and check cashing as well as the standard POS functions, said Dick Campbell, vice-president of TRW Communication Systems and Services.

"We believe over the long pull there's a place for us in the retail point-of-sale market. We're very mindful of the problems that others have had in the past," he said.

"We don't feel that any one supplier in the retail field is going to take the entire market. There's room for several suppliers," he added.

TRW will continue to provide its on-line credit authorization system that interfaces with other POS units, Campbell noted.

Production under way is fully committed to May's needs for the near term, but TRW will be out in the marketplace talking with other retailers about their requirements very shortly, he added.

The system uses a Cincinnati Milacron mini for the in-store controller and a terminal processor made by May's Transaction Data Division.

Campbell noted TRW has been developing its business in communications systems for the retail field for a number of years. The company did a lot of work with May in developing May's own in-house POS program.

Eventually "it looked like good business for both parties to put the programs together," Campbell added.

Under the agreement, TRW will manufacture over 10,000 terminals in manufacturing facilities turned over to it by S-Cubed.

May sold its interest in S-Cubed back to the shareholders and acquired 100% interest in S-Cubed's TDC Division, with which TRW is working, he explained.

Comshare Brings T/S Equipment To Japanese Joint Venture Firm

TOKYO – Comshare, Inc. has shipped an entire time-sharing system, consisting of a Xerox Sigma 9 and related peripherals and communications processors to Miroku-Comshare, its joint venture firm here.

"We feel it's important to have a machine in the country you're offering services in for two reasons," explained Richard Eidswick, Comshare vice-president. "One is to give it a national identification. It is really their system, even though it runs on our technology.

"The other is to allow offering a complete line of services. In addition to on-line time-sharing and remote batch, we can also provide some limited remote batch work."

Although it's expensive to ship a system to Japan, it "will allow Miroku-Comshare to be much more acceptable, having one computer there to allow the Japanese to be able to buy a Japanese product from a Japanese company," he said.

Other large time-sharing services available in Japan are the GE network, which operates through satellite to Cleveland, and the Nippon Telegraph and Telephone Public Corp., he noted.

'Good Feel'

Comshare's partner, Miroku, is a management consulting firm which offers batch services and "has a good feel for the marketplace," Eidswick said.

"In the case of Japan, I feel we've done it right because of the dependence on a considerably different marketplace and way of doing business and also a local identification within Japan," he remarked.

Comshare, which has trained about 14 people from Miroku and has three people on-site in Tokyo assisting in the installation, will report revenues of about $300,000 from an OEM discount in obtaining the equipment during the first quarter of fiscal 1975.

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The latest word on Data Entry, in our October 30th Supplement.

COMPUTERWORLD

CDC to Supply Ticketron Terminals

NEW YORK – Control Data Corp.'s Terminal Systems Group will supply Ticketron, Inc. with 1,000 customized "intelligent ticketing terminals" with installation beginning next year.

Ticketron serves a nationwide network of computerized box offices. With the Control Data system, a ticket seller can preset the information necessary to generate a ticket in the terminal's memory.

To make a sale, he presses a single button and the ticket is printed with date, performance, section and price.

Information that will appear on the ticket is first shown on a screen for verification, Ticketron stated.

The 6K terminal will use the Intel 8080 microprocessor, a Ticketron spokesman said. Communication with Ticketron computers will be at 1,200 bit/sec over leased lines.

Use of the intelligent terminals will substantially cut the transmission loads compared with present equipment, a Ticketron spokesman said.

For example, the unit can reserve 10 consecutively numbered tickets in one message. The current terminals need 10 separate messages to do this.

Award for Model Work Slated for Forrester

PHILADELPHIA – Jay W. Forrester was scheduled to receive the Howard N. Potts Gold Medal of The Franklin Institute last week in recognition of his pioneering work in the mathematical and computer modeling or urban, regional and global problems.

Forrester, a professor of management at MIT, obtained the basic patent on magnetic core memory systems early in the development of electronic computers.

He is the author of several books including *The Principles of Systems* and *The Limits of Growth.*

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IBM Researchers Make Advances On Organic, Bubble Memories

Research on memories at two IBM centers has produced an organic crystal with high electrical conductivity properties, as well as uncovered a more flexible means of fabricating magnetic bubble materials.

A new type of organic crystal, whose ability to conduct electricity approaches that of some metals, has been fabricated by scientists at the Thomas J. Watson Research Center, Yorktown Heights, N.Y.

The high conductivity was achieved by replacing sulfur atoms with selenium atoms in a crystal of tetrathiofulvalenium tetracyano-p-quinodimethanide, commonly called (TTF) (TCNQ).

At room temperature, the conductivity of organic "metals" lies between that of a metal and a semiconductor, and the conductivity increases manyfold as the crystals are cooled to cryogenic temperatures.

However, when cooled further – below a transition temperature – they are converted from "metals" into semiconductors.

The materials' solid state behavior, which gives rise to these effects, is poorly understood at this point, however, IBM said.

The creation of the new (TSeF) (TCNQ) crystal is promising because it is one of the most electrically conductive organic metals reported so far, and it retains this metal-like behavior to far lower temperatures than any other material, IBM said.

The atomic substitution of selenium atoms for sulfur atoms, which yields a change in electrical behavior, such as doubling electrical conductivity while keeping the structure of the crystal essentially unchanged, may be an important step toward understanding the solid state properties of the entire class of organic metals, researchers said.

Observed in Film

Magnetic bubbles have been reported in amorphous thin-film alloys made by conventional evaporation techniques.

Much simpler than "sputtering" – an alternative process for producing amorphous films – evaporation may offer new flexibility and economy in the fabrication of magnetic bubble materials, noted Dr. Neil Herman and Dr. Kenneth Lee of IBM's San Jose (Calif.) Research Laboratory.

The new magnetic bubble materials are the alloys holmium-cobalt, holmium-nickel and holmium-iron. These films, all about 1,000 angstroms thick, were able to support magnetic bubbles of comparable diameters under favorable conditions of temperature and alloy composition, they reported.

So far, the most frequently used method of preparing amorphous magnetic bubble films has been sputtering, where groups of atoms are chipped away electrically from the surface of a target material having the same composition as that of the desired alloy film.

In evaporation, high temperatures shake the atoms loose from the surfaces of individual liquid samples of the alloy constituents, and the alloy mix is created right on the substrate surface.

The great advantage of evaporation, said Lee, is that "it eliminates the trouble and expense of making a target for sputtering. It is difficult to obtain a target having the same proportion of elements throughout its entire volume, and once a target has been chosen, there is not much flexibility left in the process to vary the composition of alloy films.

"Of course," he continued, "the value of evaporation for making magnetic bubble materials depends on the quality of the end product. And so far, the superiority of evaporated bubble films has not been proved conclusively."

A Look Ahead

Executive Corner

■ Noel O. Kile has been named vice-president, international operations, for Qantel Corp.

■ Anacomp, Inc. has promoted James C. Newman to vice-president, information systems.

■ James Butler has become vice-president of product operations at Interactive Data Services, Inc., a wholly owned subsidiary of Interactive Data Corp.

■ R.J. Thielen has been appointed vice-president of operations at True Data Corp.

Orders & Installations

Westinghouse Leasing Corp. has installed a Hewlett-Packard 3000 minicomputer which includes HP's new programmable controller.

The controller links Westinghouse's W301 optical mark reader to the HP 3000. The system performs on-line editing of previously scanned information while simultaneously doing on-line data entry tasks.

The Medicus Corp. is installing its food management system in the central office and one correctional facility of the New York City Department of Correction to provide updated food management capabilities.

Handy Andy, Inc. has ordered 132 NCR 255 terminals and eight NCR 726 minicomputers for eight of its supermarkets.

Measurex Corp. received an order for two 1000/60 control systems from Finch, Pruyn & Co., Inc.

Society for Savings, a New England mutual savings bank, has ordered 100 Bunker Ramo 2001 universal teller terminals at a cost of $1 million. The CRTs will display customer account balances and other data as well as tutorial instructions for tellers during unusual transactions.

TWA has ordered 33 Incoterm Corp. SPD 20/20 intelligent terminals, valued at $234,000, for use in flight dispatch services.

Akron Standard has ordered Electronic Associates, Inc.'s Digital Tire Uniformity Optimizer Computer System to control its tire-testing machines.

Adabas, Software AG's data base management system, was installed on the state of Hawaii's IBM system as it switched from a batch-oriented to an on-line system with an integrated data base and interactive terminals.

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Europe's largest EDP market has a new newspaper...

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Biweekly now, *Computerwoche* will be published weekly in 1975, with a circulation of 22,000, including company officers, managers and top technical people at user sites throughout the German market, as well as officers and planners at computer equipment producing companies. It's a whole new way to reach the people you want to talk to in the large and growing German EDP market.

And another Caravan

The travelling Computer Users' Forum and Exposition, The Computer Caravan, will be visiting the German market again in 1975 with a five-city tour of leading German EDP markets.

Hamburg..... *February 18-20*
Dusseldorf... *February 25-27*
Frankfurt..... *March 4-6*
Stuttgart..... *March 11-13*
Munich ..... *March 18-20*

Thousands of top EDP users will be attending the German Caravan to look at peripherals, minicomputers, terminals, software, services and supplies. And 1975 should be a good year for EDP marketing in Germany, because it should be the first country to come out of the current worldwide recession—thanks to firm anti-inflationary measures applied a year ago. Overall user spending is expected to grow 14% in 1975.

If you're marketing EDP products or services in Germany—or if you'd like to—you should be looking closely at *Computerwoche* and The Computer Caravan. For more information just send in the coupon. Or you may contact Computerworld GmbH, Tegernseer Landstrasse 300, 8 Munchen 90. Phone 089 690 06 51. Telex: 5-28108. It could be die besten tat you did all day.

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Computer Automation Broadens LSI Line

IRVINE, Calif. – Computer Automation, Inc., the Naked Mini company, has expanded its line of LSI minicomputers to include the LSI Type 2/10, which has an internal cycle time of 600 nsec.

The 2/10 falls between the more expensive, twice as fast LSI Type 2/20 and the less expensive, half as fast LSI Type I, which the firm is not yet delivering.

The processor series is interchangeable with Computer Automation's line of memories, which includes 980 nsec, 1,200 nsec and 1,600 nsec core and 1,200 nsec semiconductor.

The processors feature the same architecture, instruction set and I/O modes and can be interchanged in the same motherboard without program alteration, the firm said.

An LSI 2/10 with 4K 16-bit core memory module is priced at $1,750 in single quantities from 18651 Von Karman, 92664. Delivery is 30 days.

Pertec Unveils CRT

SANTA ANA, Calif. – Pertec Corp. has unveiled the Model 7100 CRT terminal which can be used for either remote data entry or locally with a direct computer interface.

The unit features read-only memory, controlling keyboard, display and communications functions, which allow the unit to be modified to different system requirements.

The screen is 5-1/2 in. by 8-1/4 in., uses 7 by 9 dot matrix characters, 80 char./line with either 12- or 24-line versions available. Standard character set is 64 Ascii characters or 96 with lower case.

The keyboard is detachable and page and scroll modes are included.

Synchronous or asynchronous modes up to 9,600 bit/sec are optionally available as are direct computer interfaces.

A modem adapter enables daisy chaining of up to 64 terminals, the firm said.

Prices start at $2,025 each in lots of 100 from Pertec's Business Systems Division, 17112 Armstrong Ave., 92705.

OEM Products

Counter Has 4 Indicators

MOUNTAIN VIEW, Calif. – Logic Technology, Inc. has developed the Model 1812 handheld pulse counter with a LED display of up to seven digits using four indicators.

The firm is seeking to OEM the unit, priced at $150 in single quantities, to voltmeter firms which will then sell it to field service representatives who can use it for digital troubleshooting.

The unit is also expected to find a market in technicians' home laboratories and in the briefcases of piano and organ tuners.

Logic Technology, part of the Printex family of companies, also makes modules for Digital Equipment Corp.'s M Series.

The firm is located at 1950 Colony St., 94043.

Other Products

Documation, Inc. is offering the M6000 card reader, which reads 1,200 card/min from its 6,000-card capacity input hopper. Two output stacker trays have a total capacity of 8,500 cards.

The M6000 reads standard 80-column cards and sells for a single unit price of $10,450 from P.O. Box 1240, Melbourne, Fla. 32901.

– – –

The Model 336-11 from Three Phoenix Co. is designed to evaluate double-density IBM 3336-compatible single disks. The tester operates in either automatic or manual mode and can test the special servo disk.

Three Phoenix, formerly Wabash Computer Corp., is at 10632 N. 21st Ave., Phoenix, Ariz. 85029.

– – –

Dicom Industries' Model 176 digital cassette subsystem, an Ecma-compatible single-transport device, is designed to perform the normal functions of a cassette tape system and controller/formatter. It also allows "custom" designed special functions such as magnetic tape emulation.

The unit can incorporate an additional microprocessor, thus functioning as a stand-alone unit. It is priced at $975 in OEM quantities from 715 N. Pastoria Ave., Sunnyvale, Calif. 94086.

– – –

Western Digital Corp. has begun volume production of the RM1701H, an MOS/LSI 4K-bit random-access memory. The single-chip device is functionally and pin-compatible with those announced by Texas Instruments and Intel, the firm said.

Access time is 300 nsec maximum with a 470 nsec maximum cycle time. The unit, available for system prototyping, comes in a 22-pin plastic cavity package and sells for $27 in quantities over 100 from 3128 Red Hill Ave., Newport Beach, Calif. 92663.

Expansions

Computer Sciences Corp. has recently opened Infonet offices in Atlanta and Pittsburgh.

Systems Architects, Inc. is moving its headquarters to a 12-acre site at Thomas Patton Drive, Randolph, Mass.

National Semiconductor Corp. has begun construction of a 175,000-sq-ft semiconductor wafer fabrication plant in West Jordan, Utah.

Monolithic Memories, Inc. has moved into a 40,000-sq-ft building formerly occupied by Amdahl Corp. The new facility will house the Production Control and Reliability Groups as well as two new wafer fabrication lines.

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THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
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Position Announcements

Systems Programmer

For the Systems Programmer with suitable experience, this technical position offers an exceptional opportunity.

Your general assignment will be systems software on a dual IBM 370/155 OS/MFT configuration. This will involve a wide range of developmental activities including software analysis of systems performance and troubleshooting.

The requirements are dual: First, at least 6 years of large scale DP experience is called for with 3 or more concentrated in software. In depth knowledge of OS and assembler language programming is essential. Knowledge of TCAM, TOTAL, teleprocessing, and remote job entry is a plus. Second, evidence of probing interest in new advances, and the rationales of computer systems, with strong abilities in communications by writing or otherwise explaining to and informing others.

This position affords a great variety of challenge, and wide exposure for advancement. A degree in EDP or Mathematics will be an asset. The location is our Data Center in Hamilton, a few miles north of Cincinnati. Initial salary is open in the teen range, plus very complete benefits. Please send resume, in confidence, to:
Dennis Yamasaki, Employment Manager

Champion International
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We currently seek an individual to act as an internal Researcher/Consultant in the area of advanced techniques for manufacturing and testing computers (including chips, modules, processors, peripherals and complete systems).

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This position requires the ability to deal effectively with both hardware and software development engineers, as well as manufacturing personnel. The ideal candidate will have a PhD in electrical engineering, computer science, or equivalent, along with strong knowledge of computer hardware and software. The ability to apply algorithmic and heuristic methods in solving practical problems is a must. Previous experience in one or more of the following areas would be a plus- automated testing, applied artificial intelligence or advanced manufacturing methods.

If you seek an above average opportunity, and feel you can contribute in a dynamic environment, you should investigate this position.

Please direct your resume to Leo McKiernan, Digital Equipment Corporation, Research & Development Group, 162 Main Street, Maynard, Mass. 01754.

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The above positions are open for application to women and men regardless of race, national origin, age, religion or creed.

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Resume to Jon Larson
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PROGRAMMER

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Programmer/Analyst

3 years experience on third generation (370/158) hardware, COBOL language programming, Data Base Management Systems (TOTAL, IMS, etc.) desirable. Bachelor's degree in Business, Computer Science, Engineering, Mathematics or related fields or equivalent experience.

Systems Anlayst

3 years experience in design of systems for third generation hardware, preferably in a data base management, on-line environment. Project Management ability — technical writing skills — computer programming background desirable. Bachelor's or Master's degree in Business, Industrial Engineering, Information Science or related fields, or equivalent experience. Salary commensurate with experience.
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Experience desirable in any of the following:
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Bachelor's Degree in Math, Econ, Engineering or Computer Science.

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Experience desirable with any of the following:
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DATA PROCESSING SYSTEMS PROGRAMMER

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Cessna Aircraft Company
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Cessna Pawnee Division

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SYSTEMS ANALYST

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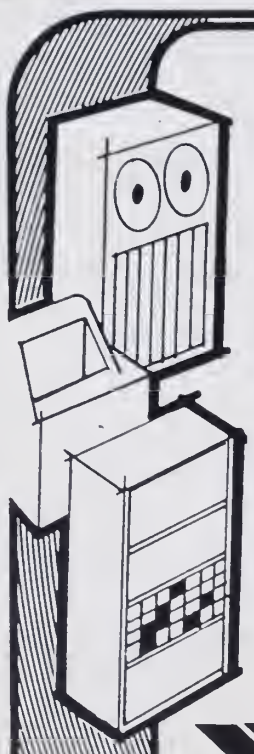

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SYSTEMS ANALYSTS

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Acquisitions

The merger of Comress, Inc., developer of software programs and hardware monitoring equipment, into Comten, Inc., a communications firm, has been completed. Revenues from former Comress operations will be included in Comten revenues only for the fourth quarter.

Final agreement has been reached for the acquisition by Tymshare, Inc. of United Data Centers, Inc. (UDC), subject to ratification by UDC shareholders. Terms call for the exchange of about 650,000 shares of Tymshare common on the basis of .45 of a share of Tymshare common for each outstanding share of UDC common.

Recognition Equipment, Inc. has agreed in principle to change the terms announced in 1972 under which it would acquire Corporation S.

The new agreement calls for a cash purchase of the common stock of Corporation S, which operates service centers for document processing systems made by Recognition Equipment.

Documation, Inc. has acquired Advanced Board Circuitries, which will continue to market its products on an OEM basis.

$7 Million Loss

Charge Sinks CDC's Third Period

MINNEAPOLIS – Control Data Corp. showed a third-quarter loss of $7 million or 46 cents a share as a result of a $30.2 million pretax charge arising from the Union Bank of Switzerland's decision to seek to discontinue a joint development project.

In the year-ago period, CDC earned $13.3 million or 81 cents a share.

CDC is effecting cost reduction programs in its computer operations to counter the effects of inflation and high interest rates.

Third-quarter revenues from the computer operations sector rose 23% to $285.2 million from $231.9 million last year. The computer sector lost $14.2 million compared with earnings of $3.3 million last year.

Commercial Credit Co., CDC's financial services subsidiary, was affected by higher average interest rates which eroded loan and leasing profit margins, the firm said.

Commercial Credit's gross income rose to $170.7 million from $141.1 million last year, but earnings dropped to $7.2 million from $10 million. However, earnings were improved over the earlier quarters of this year, the firm noted.

9 Months Drag

The charge dragged CDC's consolidated nine-month earnings down 56% to $19.7 million or $1.17 a share compared with $45.7 million or $2.80 a share in the 1973 period.

Revenues for the nine months rose 22% to nearly $818 million from $670.3 million a year ago.

Computer operations showed a loss of $6.7 million compared with earnings of $12.2 million in the nine months of 1973. Commercial Credit's earnings were off last year's pace at $26.4 million compared with $33.5 million.

Efforts are under way to arrive at acceptable terms of a settlement with the Union Bank, Chairman William Norris said.

The $30.2 million charge covers manufacturing costs, equipment purchases, special hardware, software and support costs incurred over the past three years under the Union Bank contract. The provision also provides for costs and expenses associated with the cessation of the project, the firm said.

However, the ultimate financial impact will be determined by the eventual resolution of this matter, it added.

CDC is taking several steps to reduce expenses, Norris noted. While computer business orders and revenues continue to exceed budgets, inflation and high interest rates have continued to squeeze profit margins, he explained.

CDC is shelving some technical programs and stretching out others, cutting controllable expenses and effecting small reductions in the overall work force.

NCR Posts Record Nine Month Figures

DAYTON, Ohio – NCR Corp. showed record results for the third quarter and nine months with third-quarter earnings rising 21% on an 11% increase in revenues.

Earnings reached $19.9 million or 81 cents a share compared with $16.5 million or 70 cents a share in the year-ago period.

Revenues totaled $488.1 million compared with $438 million in the same 1973 quarter.

Nine-month earnings rose 39% to $51.8 million or $2.13 a share compared with $37.3 million or $1.60 a share last year.

Revenues for the nine months totaled $1.4 million, a 9% rise over $1.2 million in the year-ago period.

U.S. earnings benefited from improved margins on newer products and reduced marketing expenses resulting from the reorganization of marketing activities effected Jan. 1, said President William S. Anderson.

However, earnings from outside the U.S. were adversely impacted by below-normal output from its Dundee, Scotland, plant, which the company said reflected component shortages and the UK's energy crisis earlier this year.

In addition, foreign currency exchange adjustments of about $5 million adversely affected third-quarter earnings.

For the nine months, adverse currency exchange adjustments totaled about $6 million and were primarily responsible for an increase of about 1% in the year-to-date effective tax rate percentage, NCR said.

Incoming business was at a high level during the quarter both in the U.S. and abroad.

However, Anderson cautioned he does not expect "any appreciable earnings increase in the fourth quarter of this year as compared with last year's fourth quarter," since the 1973 fourth quarter results were "favorably affected by sizable manpower reductions carried out earlier in 1973 and by an exceptionally heavy volume of equipment deliveries during that quarter."

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Earnings Reports

AUTOMATIC DATA PROCESSING
Year Ended June 30

	1974	a1973
Shr Ernd	$1.64	$1.40
Revenue	112,265,000	92,247,000
Earnings	10,339,000	8,708,000

a-Restated.

COMPUTER CONSOLES
Six Months Ended June 30

	1974	1973
Shr Ernd	$.48	$.07
Revenue	4,162,512	1,986,777
Earnings	841,881	119,432

INFORMATION INTERNATIONAL
Three Months Ended July 31

	1974	1973
Shr Ernd	$.16	$.13
Revenue	2,531,348	2,328,374
Tax Cred	.....	51,300
Earnings	397,708	336,268

THE COMPUTER EXCHANGE
Nine Months Ended March 31

	1974	1973
Shr Ernd	$(.06)	$.17
Revenue	4,123,091	5,374,215
Tax Cred	.....	62,012
Earnings	(51,797)	142,733

LOGICON
Three Months Ended June 30

	1974	1973
Shr Ernd	$.18	$.08
Revenue	8,174,987	3,895,038
Earnings	152,451	70,983

STANDARD COMPUTER
Six Months Ended June 30

	1974	1973
Shr Ernd	$.08	$.01
Revenue	3,204,000	1,683,000
Earnings	357,000	36,000

TEC
Year Ended June 30

	1974	1973
Shr Ernd	$.80	$1.12
Revenue	8,204,865	7,459,059
Earnings	543,580	765,904

NATIONAL SEMICONDUCTOR
Four Months Ended Sept. 22

	1974	1973
Shr Enrd	$.46	a$.33
Revenue	75,120,000	52,054,000
Earnings	5,506,000	3,978,000

a-Adjusted for a three-for-one stock split in Dec. 1973.

PLANNING RESEARCH
Year Ended June 30

	1974	1973
Shr Ernd	$.40	.....
Revenue	110,103,000	$98,128,937
Spec Chg	.....	a2,911,438
Earnings	2,673,000	b(8,452,899)

a-Principally the write-off reflecting the sale of Greenwich Data Systems, Inc. b-Includes write-off costs related to computer-based services and related change in accounting policy on deferral of development costs of $6.9 million.

TEKTRONIX
Three Months Ended Aug. 24

	a1974	b1973
Shr Ernd	$.66	$.60
Revenue	72,840,000	55,849,000
Earnings	5,752,000	5,156,000

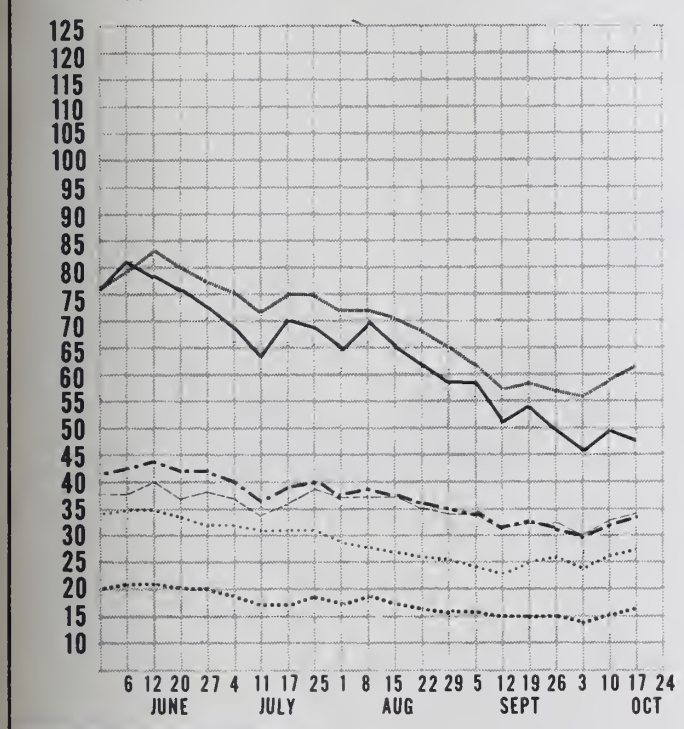
a-For 13 weeks. b-For 12 weeks.

DPF
Three Months Ended Aug. 31

	1974	a1973
Shr Ernd	$.09	$.04
Revenue	7,559,000	7,940,000
Tax Cred	263,000	77,000
Earnings	358,000	155,000

a-Restated.

COMPUTERWORLD Computer Stocks Trading Indexes



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Computerworld Stock Trading Summary

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

EXCH		1974 RANGE (1)	CLOSE OCT 17 1974	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	63-217	72 3/4	+2 1/2	+3.5
D	COMPUTER AUTOMATION	4- 14	4 1/4	+ 1/8	+3.0
N	CONTROL DATA CORP	13- 38	13	- 1/2	-3.7
N	DATA GENERAL CORP	13- 38	14 3/8	+1 7/8	+15.0
D	DATAPOINT CORP	7- 15	7 3/4	+ 1/4	+3.3
D	DIGITAL COMP CONTROL	2- 5	2 1/8	0	0.0
N	DIGITAL EQUIPMENT	56-121	56	-1 1/2	-2.6
N	ELECTRONIC ASSOC.	2- 3	1 3/4	- 1/4	-12.5
A	ELECTRONIC ENGINEER.	5- 11	5 7/8	+ 1/2	+9.3
N	EDXPDRP	19- 48	23 5/8	-1 3/8	-5.5
D	GENERAL AUTOMATION	12- 40	12 1/4	+ 1/2	+4.2
D	GRI COMPUTER CORP	1- 2	1/8	- 1/8	-50.0
N	HEWLETT-PACKARD CO	58- 90	66	+1 1/4	+1.9
N	HONEYWELL INC	23- 86	25 1/2	-1 7/8	-6.8
N	IBM	152-251	180	+3 7/8	+2.2
O	INTERDATA INC	8- 22	16 1/4	+ 5/8	+4.0
O	MICRODATA CORP	2- 5	2 1/8	+ 1/8	+6.2
N	NCR	19- 40	18 7/8	-2 1/4	-10.6
N	RAYTHEON CO	21- 39	22 3/4	- 7/8	-3.7
N	SINGER CO	14- 40	14 1/8	-1 7/8	-11.7
N	SPERRY RAND	24- 44	27 1/2	+1 1/2	+5.7
A	SYSTEMS ENG. LABS	1- 3	1 1/4	- 1/8	-9.0
N	TEXAS INSTRUMENTS	60-115	62 3/4	- 3/4	-1.1
D	ULTIMACC SYSTEMS INC	1- 2	3/4	0	0.0
N	VARIAN ASSOCIATES	6- 13	7	- 1/4	-3.4
N	WANG LABS.	7- 20	11 1/8	+ 5/8	+5.9
N	XEROX CORP	61-127	66	-6 1/2	-8.9
	LEASING COMPANIES				
D	BRESNAHAN COMP.	2- 2	2 1/8	0	0.0
O	COMDISCO INC	1- 7	1 3/4	+ 1/4	+16.6
A	COMMERCE GROUP CORP	3- 6	2 7/8	0	0.0
D	COMPUTER EXCHANGE	1- 1	1/8	0	0.0
A	COMPUTER INVSTRS GRP	1- 4	3/4	+ 1/8	+20.0
O	COMP. INSTALLATIONS	1- 1	1/4	0	0.0
M	DATRONIC RENTAL	1- 1	3/4	- 1/8	-14.2
A	DCL INC	0- 1	3/8	-	-14.3
N	DRE INC	2- 5	2 3/4	+ 1/8	+4.7
D	EOP RESOURCES	2- 3	3 1/4	0	0.0
A	GRANITE MGT	1- 3	1	+ 1/8	+14.2
A	GREYHOUND COMPUTER	2- 6	2 5/8	0	0.0
A	ITEL	3- 6	4 1/4	+ 5/8	+17.2
N	LEASCO CORP	5- 12	8 1/8	0	0.0
O	LEASPAC CORP	0- 2	3/8	0	0.0
D	LECTRO MGT INC	1- 1	1/8	0	0.0
D	NRG INC	1- 5	2 3/8	+ 1/4	+11.7
A	PIONEER TEX CORP	2- 10	3	+ 1/8	+4.3
A	ROCKWOOD COMPUTER	1- 1	1/2	-	-11.1
N	U.S. LEASING	5- 24	10 3/8	+1 1/4	+13.6
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 2	3/4	+ 1/8	+20.0
A	APPLIED DATA RES.	1- 3	1 3/8	+ 1/8	+10.0
D	APPLIED LOGIC	1- 1	1/8	0	0.0
N	AUTOMATIC DATA PROC	21- 57	31 7/8	+5 3/8	+20.2
O	BRANDON APPLIED SYST	1- 1	1/4	0	0.0
D	CENTRAL DATA SYSTEMS	4- 6	3	0	0.0
D	COMPUTER DIMENSIONS	1- 3	1 1/2	0	0.0
D	COMPUTER HORIZONS	1- 5	1 1/4	0	0.0
O	COMPUTER NETWORK	1- 2	1	0	0.0
N	COMPUTER SCIENCES	2- 4	2 3/8	+ 1/8	+5.5
O	COMPUTER TASK GROUP	1- 1	1/2	- 1/4	-33.3
O	COMPUTER TECHNOLOGY	1- 1	1/2	0	0.0
O	COMPUTER USAGE	2- 4	2 3/4	+ 1/8	+4.7
O	COMRESS	1- 1	1/4	0	0.0
O	COMSHARE	2- 4	2	+ 3/8	+23.0
N	CORDURA CORP	2- 4	1 3/4	0	0.0
O	DATATAB	1- 3	1 1/4	0	0.0
A	ELECT COMP PROG	1- 1	1/8	0	0.0
N	ELECTRONIC DATA SYS.	11- 25	12 7/8	+ 7/8	+7.2
O	INFONATIONAL INC	1- 2	1/4	- 1/4	-50.0
O	I.O.A. DATA CORP	1- 1	1/4	0	0.0
O	IRS COMPUTER MARKET.	1- 1	1/2	0	0.0
D	KEANE ASSOCIATES	2- 4	1 3/4	0	0.0
O	KEYDATA CORP	1- 6	2 1/8	+ 3/8	+21.4
O	LOGICON	2- 5	2 1/8	0	0.0
A	MANAGEMENT DATA	1- 2	1	0	0.0
D	NATIONAL CSS INC	8- 37	9	0	0.0
D	NATIONAL COMPUTER CO	1- 1	1/4	0	0.0
A	ON LINE SYSTEMS INC	18- 30	18 5/8	-2 1/8	-10.2
N	PLANNING RESEARCH	2- 3	2 1/2	+ 1/8	+5.2
O	PROGRAMMING & SYS	1- 1	5/8	0	0.0
D	RARIDATA INC	1- 5	2 3/8	+ 5/8	+35.7
O	SCIENTIFIC COMPUTERS	1- 1	5/8	0	0.0
O	SIMPLICITY COMPUTER	1- 1	3/8	0	0.0
D	TCC INC	1- 1	1/4	0	0.0
D	TYMSHARE INC	6- 12	7	+1	+16.6
D	UNITED DATA CENTER	2- 4	2	+ 1/4	+14.2
A	UPS SYSTEMS	2- 4	2	- 1/8	-5.8
N	WYLY CORP	2- 5	2 1/8	0	0.0
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	4- 11	4 3/4	- 1/8	-2.5
O	ADVANCED MEMORY SYS	1- 7	1 5/8	+ 3/8	+30.0
N	AMREX CORP	3- 5	3 5/8	0	0.0
D	ANDERSON JACOBSON	2- 4	1 3/4	0	0.0
O	BEEHIVE MEDICAL ELEC	2- 7	2 7/8	- 1/8	-4.1
O	BOLT,BERANEK & NEW	5- 9	5 3/8	0	0.0
N	BUNKER-RAMO	4- 8	5 1/4	+ 3/8	+7.6
A	CALCOMP	5- 11	6 5/8	+ 3/8	+6.0
O	CAMBRIDGE MEMORIES	4- 16	6 3/8	+1 1/8	+21.4
O	CENTRONICS DATA COMP	7- 23	11 3/4	+2 1/4	+23.6
O	CODEX CORP	8- 15	13 1/4	+1	+8.1
O	COGNITRONICS	1- 2	3/8	- 1/8	-25.0
O	COMPUTER COMMUN.	1- 2	3/8	+ 1/8	+50.0
A	COMPUTER EQUIPMENT	1- 2	1 1/4	0	0.0
O	COMPUTER MACHINERY	1- 5	1 5/8	- 1/8	-7.1
O	COMPUTER TRANSCEIVER	1- 2	3/4	- 1/8	-14.2
N	CONRAC CORP	10- 22	13 1/2	+1 5/8	+13.6
D	DATA ACCESS SYSTEMS	2- 3	2 1/2	0	0.0
O	DATA 100	5- 13	7 1/4	+1 5/8	+28.8
A	DATA PRODUCTS CORP	3- 4	3	0	0.0
D	DATA RECOGNITION	1- 1	1/4	0	0.0
O	DATA TECHNOLOGY	2- 4	1 7/8	- 1/8	-6.2
D	DECISION DATA COMPUT	3- 13	4 5/8	- 3/8	-7.5
D	DELTA DATA SYSTEMS	1- 2	5/8	0	0.0
O	DIGIDYNE CONTROLS	1- 2	1/2	- 1/8	-20.0
N	ELECTRONIC M & M	2- 4	1 5/8	- 1/8	-7.1
D	FABRI-TEK	1- 3	3/4	0	0.0
O	GENERAL COMPUTER SYS	1- 4	2 1/2	+1 1/4	+100.0
N	GENERAL ELECTRIC	30- 65	35 7/8	-1 3/4	-4.6
N	HAZELTINE CORP	3- 7	3 1/4	+ 1/8	+4.0
O	INFOREX INC	2- 5	2 7/8	+ 1/2	+21.0
O	INFORMATION DISPLAYS	1- 1	1/8	0	0.0
D	INFORMATION INTL INC	7- 14	6 3/4	- 1/4	-3.5
A	LUNDY ELECTRONICS	3- 3	2 7/8	0	0.0
O	MANAGEMENT ASSIST	1- 1	1/8	0	0.0
N	MEMOREX	2- 5	2 1/2	+ 1/8	+5.2
A	MILGO ELECTRONICS	6- 18	9 1/4	+2 1/4	+32.1
N	MOHAWK DATA SCI	1- 4	1 3/4	0	0.0
D	ODEC COMPUTER SYST.	1- 3	1 1/8	+ 1/8	+12.5
O	OPTICAL SCANNING	3- 6	2 1/2	-1	-28.5
O	PERTEC CORP	2- 6	2	- 1/8	-5.8
A	POTTER INSTRUMENT	1- 5	2	+ 1/4	+14.2
O	PRECISION INST.	1- 3	3/4	0	0.0
O	QUANTOR CORP	2- 8	2 1/2	+ 1/4	+11.1
O	RECOGNITION EQUIP	2- 5	2 1/8	+ 1/4	+13.3
N	SANDERS ASSOCIATES	2- 8	3 1/8	+ 1/8	+4.1
D	SCAN DATA	1- 2	3/4	- 1/4	-25.0
D	STORAGE TECHNOLOGY	7- 15	8 1/2	- 1/4	-2.8
O	SYCOR INC	4- 13	7	+1	+16.6
O	TALLY CORP.	2- 4	1 7/8	0	0.0
O	TEC INC	2- 7	2 3/4	+ 1/2	+22.2
N	TEKTRONIX INC	22- 48	26 3/8	+2 7/8	+12.2
N	TELEX	3- 4	3 3/8	- 1/8	-3.5
O	WANGCO INC	5- 13	4 7/8	+ 1/8	+2.6
D	WILTEK INC	2- 8	2	0	0.0
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	4- 6	4 1/2	0	0.0
A	BARRY WRIGHT	4- 7	4 7/8	+ 1/2	+11.4
O	CYBERMATICS INC	1- 2	1/2	- 1/8	-20.0
A	DATA DOCUMENTS	23- 54	30 1/2	+1 1/2	+5.1
O	DURLEY PRODUCTS INC	6- 17	13 1/2	+ 1/2	+3.8
N	ENNIS BUS. FORMS	4- 7	5 1/4	0	0.0
O	GRAHAM MAGNETICS	6- 11	8 1/4	+1 1/2	+22.2
O	GRAPHIC CONTROLS	6- 11	7	+ 3/4	+12.0
N	3M COMPANY	47- 79	58 1/2	+4 1/8	+7.5
O	MOORE CORP LTD	33- 57	39 1/4	+ 3/4	+1.9
N	NASHUA CORP	24- 45	27 1/8	+1 1/8	+4.3
O	REYNOLDS & REYNOLD	8- 35	8 1/2	-2	-19.0
D	STANDARD REGISTER	10- 16	11 3/4	+ 1/2	+4.4
O	TAB PRODUCTS CO	5- 11	6	+1 1/4	+26.3
N	UARCO	13- 23	15 1/2	+ 5/8	+4.2
A	WABASH MAGNETICS	3- 7	3 5/8	+ 1/8	+3.5
N	WALLACE BUS FORMS	14- 24	15 1/2	+ 1/2	+3.3

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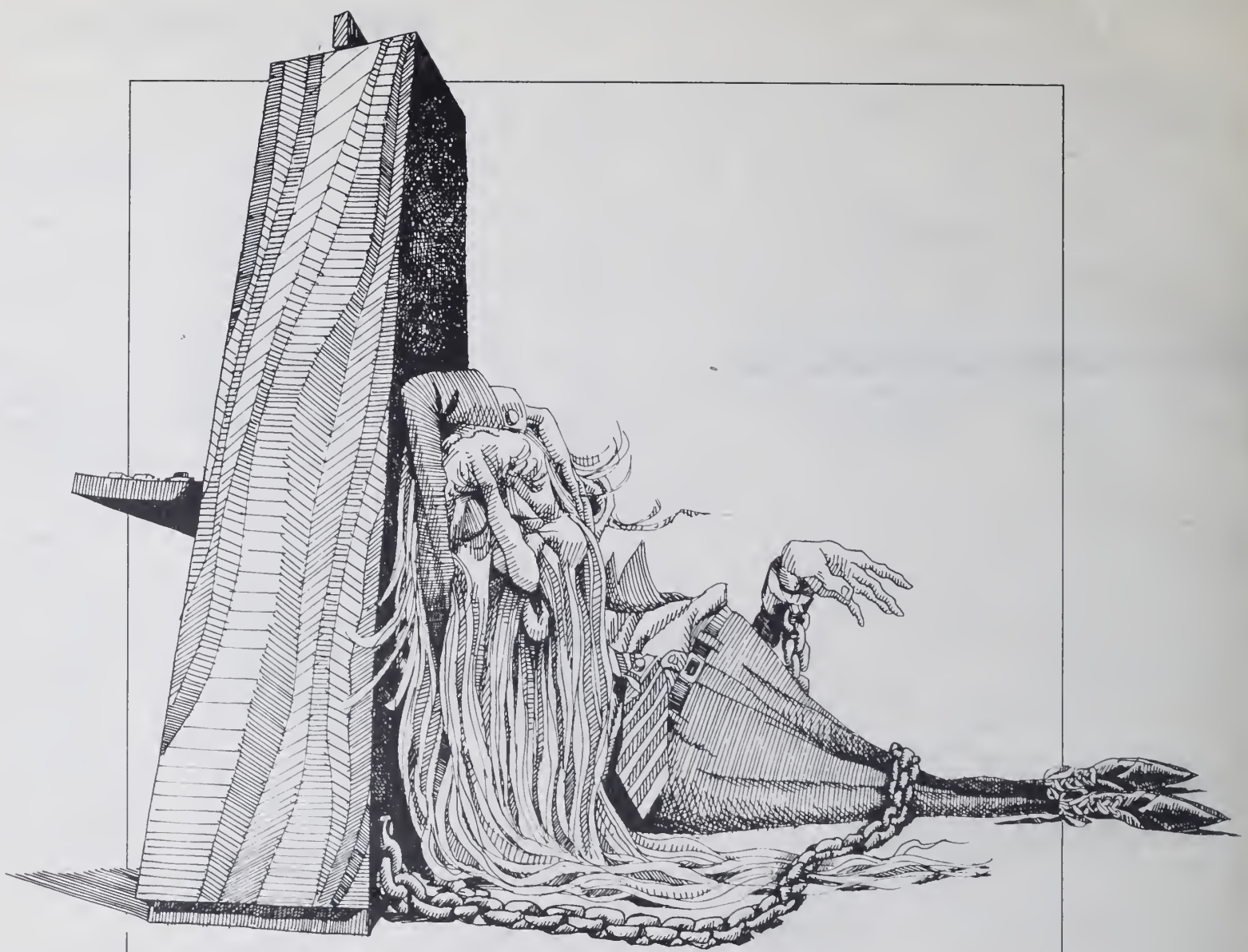

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